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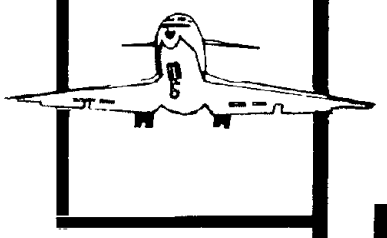

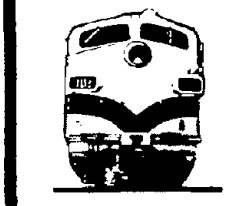

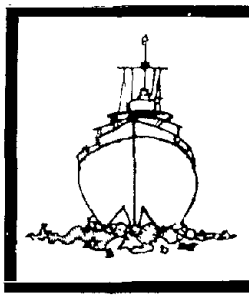

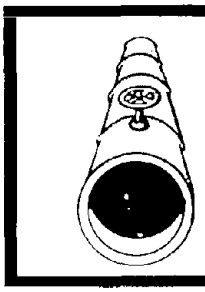

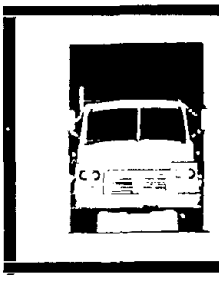

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

RAILROAD/HIGHWAY ACCIDENT REPORT

COLLISION OF A BALTIMORE AND OHIO FREIGHT TRAIN WITH A PICKUP TRUCK

BECKEMEYER, ILLINOIS

FEBRUARY 7, 1976

REPORT NUMBER: NTSB-RHR-76-3

UNITED STATES GOVERNMENT

TECHNICAL REPORT DOCUMENTATION PAGE

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15. Supplementary Notes

16. Abstract

At 6:50 p.m., c.s.t., on February 7, 1976, a westbound Baltimore and Ohio freight train struck a pickup truck at an unprotected grade crossing in Beckemeyer, Illinois, when the pickup truck proceeded across the crossing without stopping. Of the 16 persons in the truck, 12 were killed and 3 were injured.

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to perceive the approaching train and to stop his vehicle short of the tracks. The lack of active grade crossing signals at the crossing probably contributed to his failure to perceive the train.

As a result of its investigation of the accident, the National Transportation Safety Board made two recommendations to the Federal Highway Administration.

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TABLE OF CONTENTS

	Page
SYNOPSIS	1
INVESTIGATION	1
The Accident	1
Injuries to Persons	5
Vehicle Information	5
Driver Information	5
Grade Crossings	6
ANALYSIS	6
CONCLUSIONS	7
(a) Findings	7
(b) Probable Cause	8
RECOMMENDATIONS	8

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D. C. 20594

RAILROAD-HIGHWAY ACCIDENT REPORT

Adopted: August 25, 1976

COLLISION OF A BALTIMORE AND OHIO FREIGHT TRAIN WITH A PICKUP TRUCK BECKEMEYER, ILLINOIS FEBRUARY 7, 1976

SYNOPSIS

At 6:50 p.m., c.s.t., on February 7, 1976, a westbound Baltimore and Ohio freight train struck a pickup truck at an unprotected grade crossing in Beckemeyer, Illinois, when the pickup truck proceeded across the crossing without stopping. Of the 16 persons in the truck, 12 were killed and 3 were injured.

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to perceive the approaching train and to stop his vehicle short of the tracks. The lack of active grade crossing signals at the crossing probably contributed to his failure to perceive the train.

INVESTIGATION

The Accident

On February 7, 1976, a Baltimore and Ohio freight train, Extra 4008 West, departed Washington, Indiana, en route to East St. Louis, Illinois. As the train approached Beckemeyer, Illinois, about 6:45 p.m., the engineer was operating the train controls at the right front of the lead unit, the head brakeman was seated at the left rear of the front unit, the fireman was seated on the right side of the second unit, and the conductor was riding in the caboose. The traincrew reported that the evening was clear and that visibility down the track was excellent.

When the train reached the whistle board which was about 1/4 mile east of the Scoville Street grade crossing in Beckemeyer, the engineer began to sound the standard crossing whistle. Witnesses reported that as the train approached the crossing, the two fixed headlights on the front of the lead unit were illuminated and the whistle was being sounded.

As the train approached the crossing, a 1967 GMC pickup truck, with 6 persons (including 4 small children) in the cab and 10 persons in the back of the truck, was traveling west on Beckemeyer Street at 15 to 18 mph. Witnesses later reported that the truck turned left onto Scoville Street and proceeded south toward the grade crossing without appearing to change speed. The engineer of the train stated that he saw the truck's headlights as it proceeded south on Scoville Street and he assumed that the truck would stop at the crossing; however, it moved up the grade and onto the tracks without stopping. The train struck the truck about 6:50 p.m.

The engineer placed the train control in emergency braking as the lead unit hit the truck. The coupler on the front of the locomotive penetrated the truck cab in the door area, immediately behind the front door post on the driver's side. (See Figure 1.) The truck body was torn off and thrown to the right of the train. The cab and chassis of the truck were wrapped around the lead unit. The train stopped about 2,500 feet west of the impact point.

Scoville Street is a north-south-two-lane, asphalt-surfaced road that runs between Beckemeyer and First Streets and crosses the railroad tracks 218 feet south of Beckemeyer Street. (See Figure 2.) The 20-foot-wide street narrows slightly as it approaches the grade crossing. The grade increases 3 percent, beginning about 90 feet from the crossing; near the crossing, the grade increases sharply. The posted speed limit on Scoville Street is 25 mph.

As the truckdriver approached the railroad track from the north, his view east along the track was obscured by dwellings. Thirty-five feet south of Beckemeyer Street, he could have seen the upper portion of the engine, including the headlights, over the garage which was behind the dwellings. One hundred feet from the track, his view of the train and the track became unobstructed, and remained so up to the track.

The single railroad track is straight and level for over 1 mile in both directions from the crossing, and is elevated about 3 to 4 feet above the surrounding area. The maximum track speed for freight trains is 60 mph. A standard crossbuck warning sign is located on the shoulder on each side of the track. There were no other signs or devices present on either approach to the track. However, as a result of this accident, the Illinois State Commerce Commission held a public hearing to examine the grade crossings in Beckemeyer, and directed that a flashing light signal be installed at the Scoville Street crossing.

According to the Illinois State Police records, no other fatal accidents have occurred at the crossing.

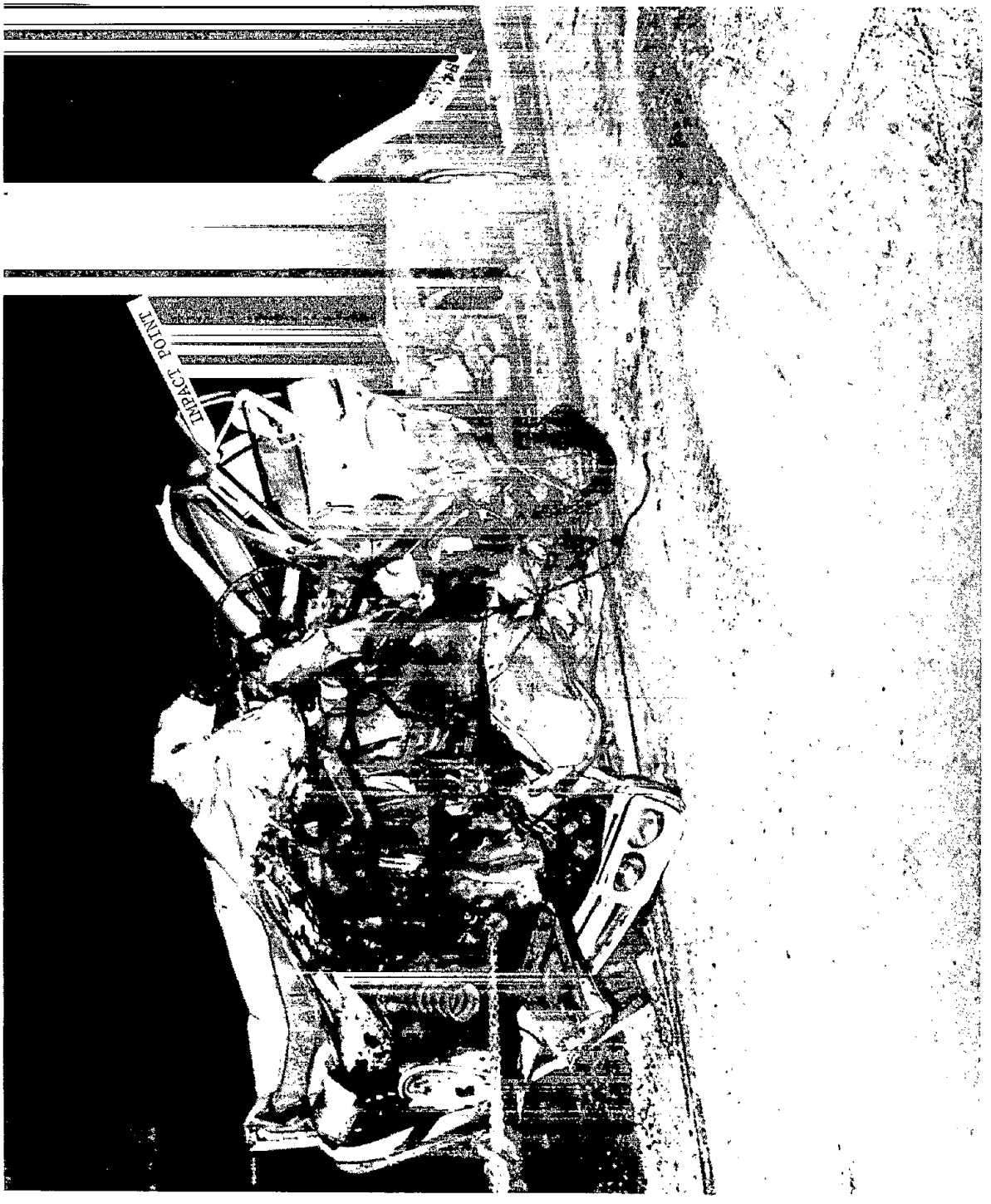

Figure 1. Damage to truck.

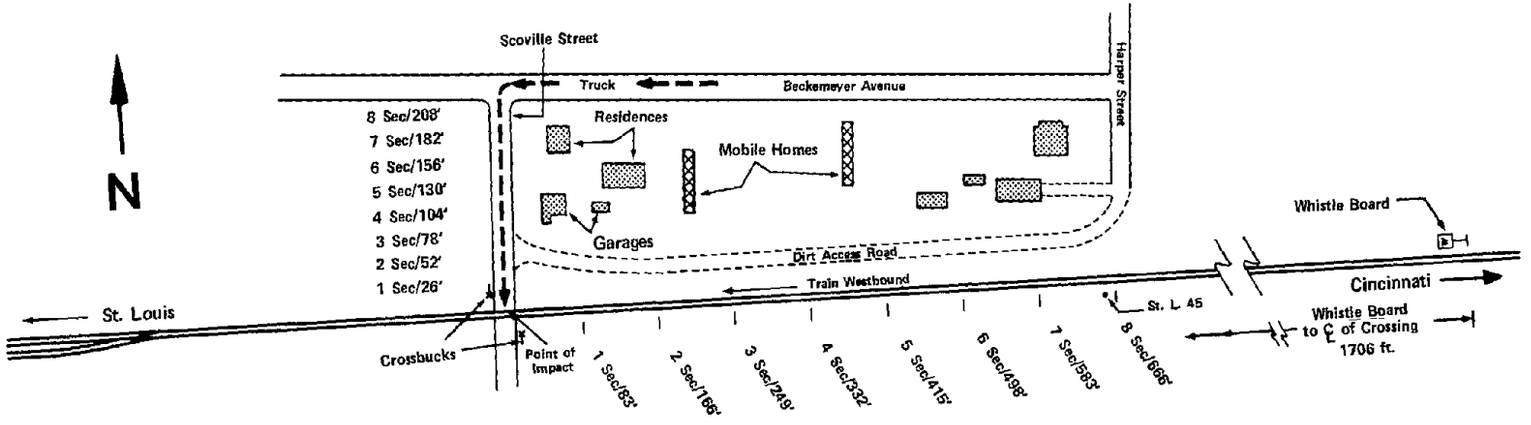

FIGURE 2. PLAN VIEW OF ACCIDENT SITE, BECKEMEYER, ILLINOIS.

Injuries to Persons

Injuries	Driver	Passengers	Traincrew
Fatal	1	11	
Nonfatal		3	
None		1	4

Vehicle Information

The Truck -- The truck was a 1967, GMC, 1/2-ton pickup with a standard V8 engine and a manual transmission. A metal cap with plastic windows was installed on the truck body. The floor of the truck body was insulated and padded. Rear view mirrors were mounted on the doors on both sides of the truck. The cab of the truck was equipped with a radio, a heater, and a tape deck. It could not be established from examination of the wreckage whether the radio or the tape deck were being operated at the time of the accident.

The pickup was destroyed in the accident, making a postcrash mechanical inspection impractical.

The Train -- The train was owned and operated by the Baltimore and Ohio Railroad and consisted of 3 diesel units, 31 loaded freight cars, 36 empty cars, and a caboose. The lead power unit, a model GP locomotive, was equipped with two fixed headlights, an external horn, and a bell.

The collision bent the right-front grab iron, the right-front pilot, a front support, and a hand rail, and broke two air hoses on the lead unit.

The brakes and the track sanding equipment of all three power units, and the horn, the bell, and the lights of the lead unit were inspected by Federal Railroad Administration personnel following the accident and were reported to be operating satisfactorily.

Driver Information

Truckdriver -- The truckdriver was a 60 year-old male. He held a valid Illinois driver's license which indicated no restrictions. His traffic record showed no accidents or violations.

Acquaintances of the driver stated that he did not wear glasses, that he never appeared to have evidenced any hearing difficulty, and that he was familiar with the Scoville Street crossing. A blood alcohol test of the driver following the accident was negative.

Locomotive Engineer -- The engineer had 31 years of railroad experience. He was promoted to locomotive engineer in 1957. The engineer and crew were subject to the Baltimore and Ohio operating rules and the train was being operated in accordance with those rules.

Grade Crossings

In 1972, there were 158,000 grade crossings in the United States which did not have active signal systems such as flashing lights or gates to warn of an approaching train. 1/ These grade crossings are located on public roads that are not part of the Federal-aid highway system. More than 10,000 of these crossings were in Illinois. Two of the four crossings in Beckemeyer, including the Scoville Street crossing, did not have active protection. Jurisdiction over grade crossings which are located on public roads that are not in the Federal-aid system rests within the individual states and usually is shared by one or more local public agencies and the railroad.

At least a dozen models or formulas have been developed during the past 40 years to assess the degree of hazard associated with railroad crossings. The models and formulae are based on a combination of such factors as the volume and speed of the vehicular traffic on the roadway, the volume and speed of trains, the volume of pedestrian traffic, the amount of reduced sight distance, and the accident reports. The data obtained when a model or formula is applied to a crossing is one factor used in determining the type of active signal equipment to be used and the priority for its installation.

ANALYSIS

Since witnesses saw the train's headlights and heard its horn as it approached the crossing, the driver also could have seen the approaching train during at least the last 100 feet of truck travel along Scoville Street. At the estimated truck speed of 15 to 18 mph, a brake application should stop the truck within 25 feet. Therefore, the driver had nearly 75 feet of travel to perceive the approaching train, apply the brakes, and stop the truck before entering the crossing.

It could not be determined why the driver did not perceive the oncoming train and stop before he entered the crossing. Perhaps he was distracted by the number of passengers in the cab of the truck, by the radio, by the tape player, or perhaps by a combination of these factors.

1/ Report to Congress, Railroad-Highway Safety, Part II, "Recommendations for Solving the Problem," Department of Transportation, 1972.

It is reasonable to assume, however, that if there had been an active traffic control device at Scoville Street, the flashing lights or gate probably would have prevented the accident by warning the driver of the approaching train.

The train engineer did not know that the truckdriver was not going to stop until almost the instant of impact. It is impossible for an engineer to stop his train short of a crossing, from any speed, between the instant that he realizes a vehicle is not going to stop at a crossing and the actual impact.

Ideally, there should be either a grade separation or an active signal system at every railroad crossing. The fact that there are over 158,000 unprotected grade crossings in the United States makes this goal almost impossible to achieve. There are not enough resources available to install active controls on all of these crossings. This means that each unprotected grade crossing must compete with all other such crossings for those resources that have been allocated to install active signal equipment.

There are at least four alternatives to deal with the problem of unprotected grade crossings: (1) Develop additional resources, (2) develop new, highly reliable, less expensive signal systems, (3) reduce the number of grade crossings, and (4) a combination of these alternatives.

While funds are being developed and research and development on signal systems is progressing, none of the grade crossing models or formulae are structured to produce a decision to close a crossing, or to consolidate two or more crossings into one. Such a decision would reduce the number of grade crossings and would also reduce the resources required to install active signal systems.

CONCLUSIONS

(a) Findings

1. There was no evidence developed in the investigation to suggest mechanical difficulty either with the truck or with the train before the collision.

2. The sight distance at the crossing is adequate within the legal speed of Scoville Street and the timetable speed of the railroad track.

3. A flashing light signal system or other active warning device at this crossing would have greatly reduced the likelihood of this accident.

4. It could not be determined why the driver of the pickup truck failed to perceive the oncoming freight train and why he drove his vehicle onto the tracks in front of the train.

5. It is impossible for an engineer to stop his train short of a crossing, from any speed, between the instant he realizes a vehicle is not going to stop at a crossing and the impact.

6. The resources that would be required to install an active traffic control system at every unprotected grade crossing in the United States are so enormous that for the foreseeable future, this appears to be outside the bounds of practicality as a total solution to the grade crossing problem.

7. Alternatives to deal with the problem of unprotected grade crossings are: (1) Develop additional resources, (2) develop new, reliable, less expensive signal systems, (3) reduce the number of grade crossings, and (4) combinations of these alternatives.

(b) Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the pickup truckdriver to perceive the approaching train and stop his vehicle short of the tracks. The lack of active grade crossing signals at the crossing probably contributed to his failure to perceive the approaching train.

RECOMMENDATIONS

As a result of its investigation of this accident, the National Transportation Safety Board submitted the following recommendations to the Federal Highway Administration:

"Develop models or formulae and criteria which in addition to assessing the hazard levels of grade crossings, will produce an output which indicates the need to consolidate and upgrade crossings or to close certain crossings. (H-76-31) (Class II, Priority Followup)

"Publish these models, formulae, and criteria, make them available to each State and to the operating railroads, and urge their use in assessing grade crossings. (H-76-32) (Class II, Priority Followup)"

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ WEBSTER B. TODD, JR.
Chairman

/s/ KAY BAILEY
Vice Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PHILIP A. HOGUE
Member

WILLIAM R. HALEY, Member, did not participate.

August 25, 1976