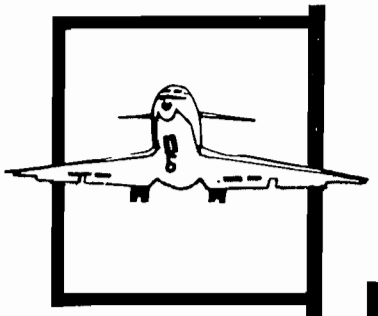

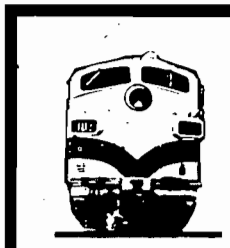

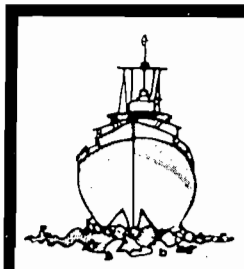

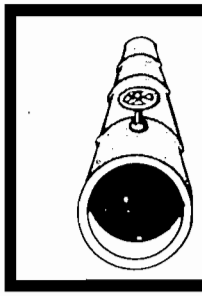

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

RAILROAD ACCIDENT REPORT

COLLISION OF READING COMPANY COMMUTER TRAIN AND TRACTOR-SEMITRAILER

NEAR YARDLEY, PENNSYLVANIA

JUNE 5, 1975

REPORT NUMBER: NTSB-RAR-76-4

UNITED STATES GOVERNMENT

TECHNICAL REPORT DOCUMENTATION PAGE

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15. Supplementary Notes

16. Abstract

About 11:06 p.m. on June 5, 1975, a Reading Company commuter train struck a tractor-semitrailer (truck) at a grade crossing near Yardley, Pennsylvania. The truck was transporting three coils of steel, two of which penetrated the first commuter car. The three occupants of the lead car were killed and an occupant of the second car was injured slightly. The truckdriver was uninjured. The semitrailer was torn from the tractor and damaged beyond repair and the lead commuter car was damaged extensively.

At the time of the collision, the automatic grade crossing signal system was functioning. The truckdriver said he had not seen or heard the warning signals.

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to stop the truck in accordance with the warning signals.

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FOREWORD

The accident described in this report was investigated under the authority of the Independent Safety Board Act of 1974. The report is based on facts from an investigation conducted by the National Transportation Safety Board in cooperation with the Federal Railroad Administration, Pennsylvania Public Utility Commission, the Lower Makefield Township Police, the Reading Company, the General Electric Company, the Evans Transportation Company, and the United States Steel Corporation.

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File No. SS-R-38

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D. C. 20594

RAILROAD ACCIDENT REPORT

Adopted: March 3, 1976

COLLISION OF READING COMPANY COMMUTER TRAIN AND TRACTOR-SEMITRAILER, NEAR YARDLEY, PENNSYLVANIA JUNE 5, 1975

SYNOPSIS

About 11:06 p.m. on June 5, 1975, a Reading Company commuter train struck a tractor-semitrailer (truck) at a grade crossing near Yardley, Pennsylvania. The truck was transporting three coils of steel, two of which penetrated the first commuter car. The three occupants of the lead car were killed and an occupant of the second car was injured slightly. The truckdriver was uninjured. The semitrailer was torn from the tractor and damaged beyond repair and the lead commuter car was damaged extensively.

At the time of the collision, the automatic grade crossing signal system was functioning. The truckdriver said he had not seen or heard the warning signals.

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to stop the truck in accordance with the warning signals.

FACTS

The Accident

On June 5, 1975, Reading Company commuter train 571 was traveling westbound en route from Trenton, New Jersey, to Philadelphia, Pennsylvania, on the New York Branch of the Reading Company. The train consisted of two cars, No. 9024 and No. 9023. The train was traveling at an estimated speed of 60 mph toward the Stony Hill Road grade crossing near Yardley, Pennsylvania.

The engineer was at the forward control station of the lead car, No. 9024. His view forward through the front window at the control station was obscured by the configuration of the control station, the curvature of the track, and the adverse weather conditions. A trainman and one passenger were seated, facing forward, on the right side of the lead car, one on the aisle and one next to the window. The conductor was riding in the front of the passenger section on No. 9023.

As the train was approaching the grade crossing from the east at about 11:05 p.m., a tractor-semitrailer (truck) was approaching the crossing from the south. The truck was occupied only by the driver and was carrying three coils of steel, individually secured to the trailer bed by chains. Two of the coils weighed 8 tons and one coil weighed 5 tons.

Three hundred feet south of the crossing, the truckdriver's view of the grade crossing and of the crossing's warning signals was obscured by the structure of the tractor and the adverse weather conditions.

The truckdriver stated that he had downshifted and was traveling about 15 mph as he approached the grade crossing. He neither saw flashing lights nor heard any bells or train whistle, so he proceeded to cross the tracks. His first indication that a train was coming was when he saw its headlights illuminate the tractor's cab. He attempted to accelerate to clear the tracks, but he was not able to do so before the train struck the trailer. The collision occurred at 11:06 p.m., based on the time at which the engineer's watch had stopped.

The lead car's buffer sill struck the right rear of the trailer. The protruding car coupler penetrated the trailer's main-frame rail 8 feet from the rear of the trailer, about 3 feet above ground level. The fifth-wheel assembly was torn free of the tractor and the trailer was rotated clockwise and westward down the track. The coils of steel were torn from the chains which had secured them to the trailer. The two coils on the rear of the trailer entered the lead rail car. The 8-ton coil on the front of the trailer dropped onto the pavement north of the tracks.

The body of the engineer was found on the floor in the aisle to the rear of the 5-ton coil, about 22 feet from the control station. The trainman and the passenger were found pinned in their seats by the collapsed vestibule partitions. The center vestibule compartment had been dislodged rearward 26 feet, to the vicinity of the 23rd row of seats, by the 8-ton coil.

The conductor, who had been riding in the front of the second car, was thrown from his seat upon impact and was injured slightly. The truckdriver was uninjured.

The train stopped 1,155 feet west of the crossing.

Accident Site

The Railroad -- The New York Branch of the Reading Company consists of double tracks that run southwest and northeast between Trenton, New Jersey, and Philadelphia, Pennsylvania. The railroad right-of-way is 150 feet wide west of the centerline of Stony Hill Road and 200 feet wide east of the centerline.

The track is straight from 11,000 feet east of the crossing to a 540-foot, 1-degree curve to the left, 942 feet east of the crossing. The track is straight for the final 402 feet. The tracks have a 0.36-percent upgrade approaching the crossing from the east.

Two automatic back-to-back flashers with crossbucks are located within the railroad right-of-way, one in the southeast guadrant of the crossing and the other in the northwest quadrant. Both of these flashers faced north and south along Stony Hill Road. The flasher in the northwest quadrant is also equipped with a bell and with an additional flasher, which faces a service road that enters Stony Hill Road on the north side of the tracks. All the warning signals are activated by westbound trains when they reach a point 5,170 feet east of the crossing's centerline. The duration of the visual and audible signals is dependent upon the speed of each individual train; the faster the speed of the train, the shorter the warning time before the train reaches the crossing. At 60 mph, train 571 would have provided just less than 1 minute of warning to drivers approaching the grade crossing from either direction on Stony Hill Road.

A whistle board was located 1,331 feet east of the crossing. A speed board, indicating a 60-mph speed zone, was located 750 feet east of the crossing. (See Figure 1 for the location of railroad devices and other physical objects along the track.)

The Highway -- Stony Hill Road is a 20-foot-wide, asphalt-paved, two-lane, north-south, winding country road maintained by the Commonwealth of Pennsylvania. The two lanes are separated by solid double yellow lines. There is a 4-inch-wide, solid white line on the outer edges of the pavement. The posted legal speed is 45 mph. (See Figures 1 and 2.)

Five hundred and eighty-five feet south of the grade crossing, northbound motor vehicle traffic crosses a short, narrow bridge, after which the roadway returns to a 20-foot width. About 400 feet south of the crossing, the road begins a 4-percent upgrade and at 350 feet, the road begins a 3-degree curve to the right. It continues on that grade and curve to within 50 feet of the crossing, where the grade decreases to about 1.5 percent and the road straightens. The road crosses the railroad tracks at an 85-degree angle.

A sign to give motorists advance warning of the railroad crossing is located on the right side of the roadway, about 460 feet south of the crossing. The sign is obscured partially to motorists approaching from the south by bushes and tree branches.

The automatic railroad flasher signal and crossbuck, located on the left side of Stony Hill Road, are visible to motorists approaching from the south about 500 feet from the crossing. The automatic flasher and crossbuck, located on the right side of the crossing, are visible from the south about 300 feet from the crossing.

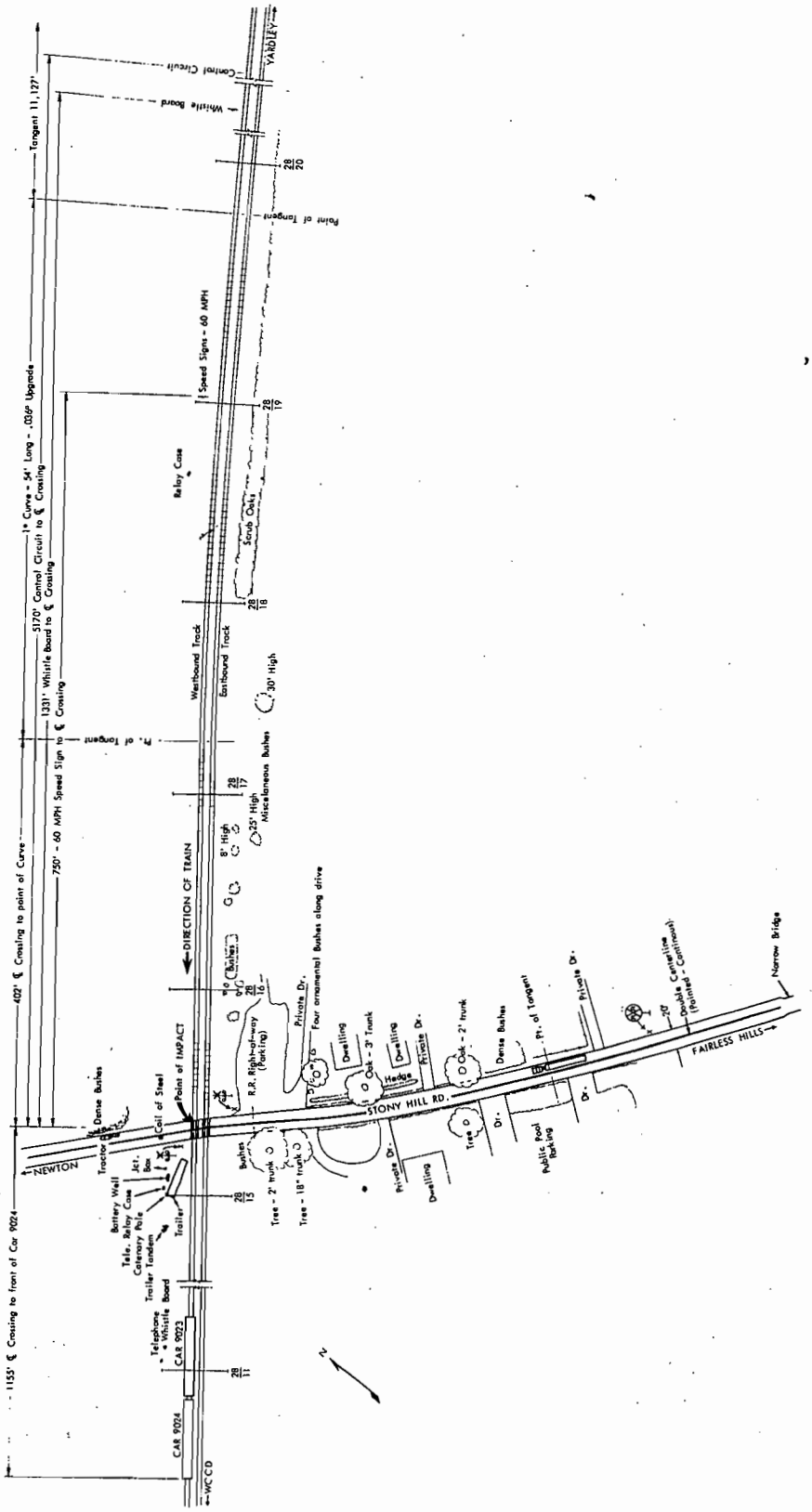


Figure 1. Plan of Stony Hill rail/highway grade crossing.

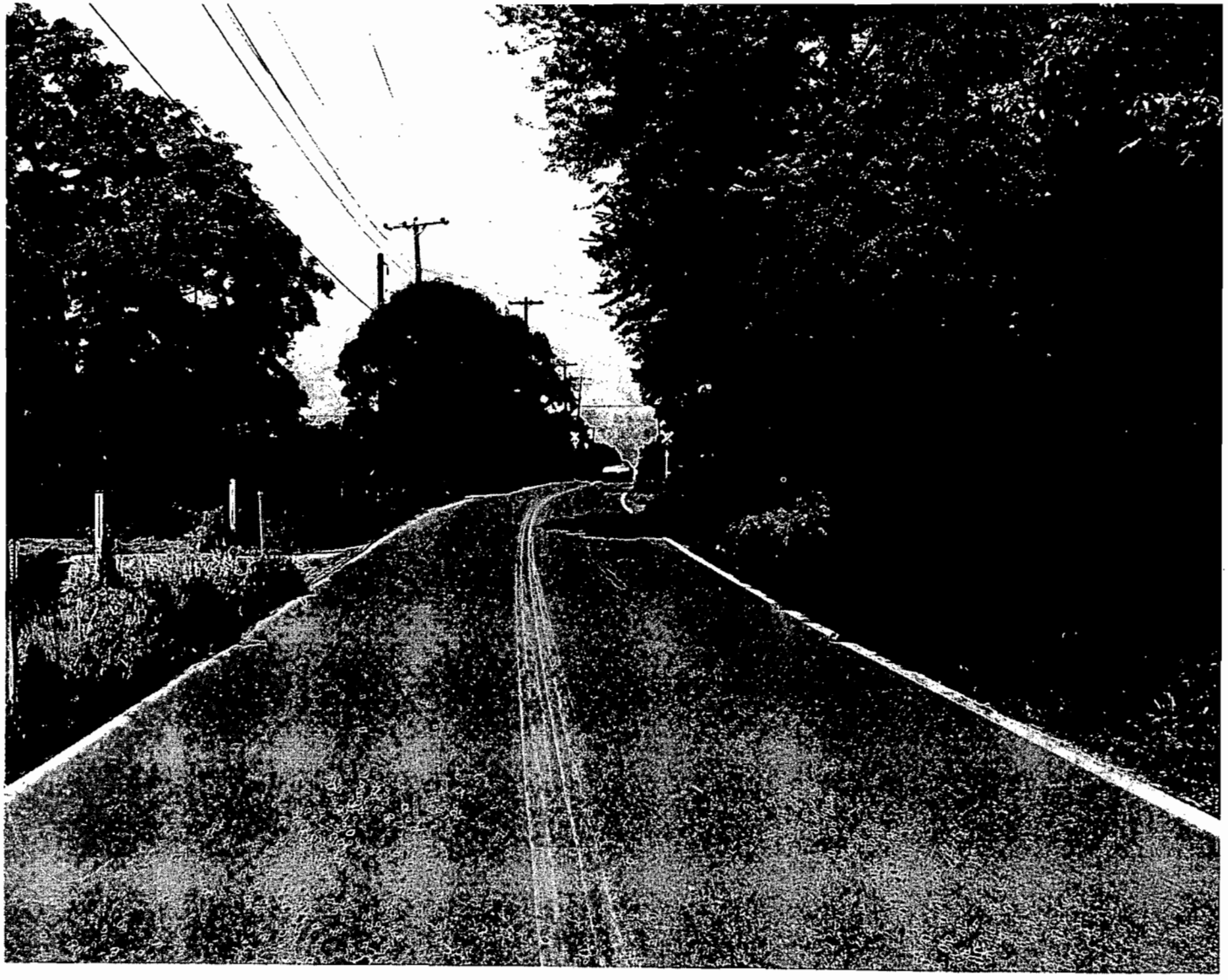


Figure 2. Stony Hill grade crossing from direction of truck.

Motorists and traincrews who had traversed the grade crossing earlier in the evening stated the automatic warning signal had been functioning.

A traffic survey on Stony Hill Road in the vicinity of the crossing was conducted in 1973. The average daily traffic volume for northbound and southbound traffic was 2,420 vehicles. Two weeks after the accident, a 24-hour survey yielded the following count:

Tractor-semitrailers	131
Trucks	191
Pickups	204
Cars	2,080
Misc.	39
Total	2,648
Trains	38

From January 1, 1974, through June 6, 1975, there were four accidents, including this collision, at the Stony Hill Road grade crossing. These accidents resulted in four fatalities, nine injuries, and property damage estimated at $420,000.

The Stony Hill Road grade crossing had been assigned a hazard-rating index number of .041. 1/ A hazard-rating index number of .041 means that no additional protection is currently warranted.

Environmental Factors -- On the night of the accident, a thunderstorm was in progress. It was raining hard. There was no artificial lighting along this section of Stony Hill Road.

As the driver approached the crossing from the south, the driver's view east along the tracks was obscured by trees, bushes, a hedge, and a residence up to a point 110 feet south of the nearest rail. For the next 80 feet, his view east was obscured intermittently by bushes and trees. He did not have an unobstructed view to the east until 30 feet south of the nearest rail. At that point, the truckdriver could have seen about 250 feet east along the track. His view to the west was obstructed almost totally until he was about 25 feet south of the nearest rail.

The Train

Train 571 consisted of two electrically driven, stainless steel commuter cars, equipped with electric-pneumatic and dynamic brakes. The

1/ The Federal Aid Safer Roads Demonstration Program, Section 230 of the Highway Act of 1973.

cars had seats for 129 passengers. Two fixed, sealed-beam, white headlights were mounted above the front vestibule door. There was no speed-recording device on the train.

The cars were manufactured by the General Electric Company in 1971 to specifications which required that they withstand an 800,000-pound static compression end load at the centerline of the draft gear. The cars were equipped with collision posts. Each car was 85 feet long and weighed about 127,000 pounds. They were propelled by alternating-current traction motors that were powered through an overhead catenary system. Train movement was controlled by an automatic signal system, acted upon by the engineer.

The Reading Company maintenance records for cars No. 9023 and 9024 revealed that the required monthly inspections had been performed in May 1975; the required biennial inspections had been performed on No. 9023 in June 1974 and on No. 9024 in May 1975. No discrepancies were noted in these records for either car.

The conductor stated that in preparation for the trip to Philadelphia, the engineer had changed ends and the engineer and the brakeman had tested the brakes properly before the train departed from Trenton at 10:54 p.m. on June 5, 1975. The conductor noted nothing unusual about the train at that time.

The Truck

The tractor-semitrailer was owned and operated by Donald C. Metzger of Warrington, Pennsylvania. It was leased to David Graham Company of Kearny, New Jersey, which leased it to Evans Transportation Company of Levittown, Pennsylvania, under the provisions of Federal Motor Carrier Safety Regulations. The gross weight of the truck and cargo was calculated to have been 71,930 pounds. The legal gross weight permitted by Commonwealth of Pennsylvania law is 73,000 pounds.

The Tractor -- The tractor was a 1968 Kenworth, Chassis No. 111259, conventional three-axle tractor with a sleeper box. It was equipped with a diesel engine, a four-speed main transmission and a four-speed auxiliary transmission, air brakes, and a Fontaine sliding fifth-wheel assembly. The tractor was not equipped with a tachograph. The tractor weighed about 17,000 pounds. It had been inspected on April 2, 1975, in compliance with the motor vehicle laws of the Commonwealth of Pennsylvania.

The Trailer -- The semitrailer was a 1971 Brown flatbed, Model 40P1-H2S, Serial No. M712355. It was manufactured by Clark Equipment Company and was equipped with a sliding tandem axle suspension. The

trailer had been inspected on May 14, 1975, in compliance with the motor vehicle laws of the Commonwealth of Pennsylvania.

The physical characteristics of the trailer were as follows:

Empty weight	11,290 pounds
Trailer length	40 feet
Trailer height (top of bed)	54 3/8 inches
Trailer width	96 inches

The Cargo -- The cargo consisted of three coils of steel, weighing 16,500 pounds (35 1/8 inches high by 48 3/4 inches in diameter), 16,060 pounds (35 1/8 inches high by 47 3/4 inches in diameter), and 10,480 pounds (35 1/8 inches high by 40 inches in diameter). Each coil was on a pallet (56 inches by 56 inches by 7 inches) which weighed about 200 pounds. The gross cargo load was 43,640 pounds. The three coils had been loaded on the trailer by United States Steel Corporation (U.S. Steel) employees, under the direction of the truckdriver.

The driver secured the palletized coils individually to the trailer bed with chains and chain binders and covered the coils with tarpaulins, which were secured. (See Figure 3.) Upon departure from U.S. Steel at 10:50 p.m., June 5, 1975, the load was inspected at the gate by company personnel for compliance with U.S. Steel loading requirements.

The Traincrew

The traincrew consisted of an engineer, a brakeman, and a conductor. They were qualified in their respective positions in accordance with Reading Company rules and were in compliance with requirements of the Federal Railroad Administration's hours-of-service regulation.

The Truckdriver

The truckdriver, 24 years old, was self-employed and had leased his truck and services to drive for David Graham Company in August 1974. He had been employed as a commercial driver for 2 years. At the time of the collision, he held a valid Commonwealth of Pennsylvania motor vehicle operator's license which authorized him to operate the type of equipment involved in the collision. He was certified as medically qualified to drive in interstate and intrastate commerce. The truckdriver was familiar with Stony Hill Road, and he frequently had used the route that he used on the day of the accident.

The Commonwealth of Pennsylvania's Bureau of Traffic Safety records revealed two tractor-trailer accidents and a traffic violation.

Damage

The Train -- The 8-ton coil of steel on the rear of the trailer struck the left front collision post of the lead car 38 inches above the

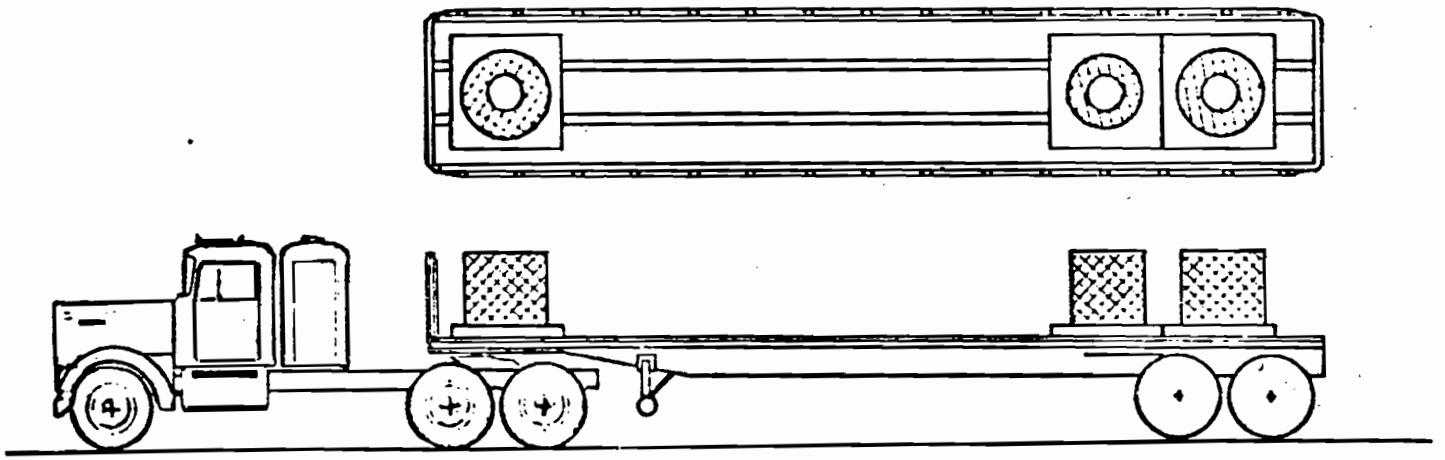


Figure 3. Plan view and profile of truck and cargo, representing typical loading method.

car floor, shearing the post at its base. The coil entered the front of the car, passed through the control vestibule, dislodged the front passenger compartment bulkhead, and entered the passenger compartment, damaging seats along the front left side of the car. Across the aisle, it dislodged seats and deformed the car wall along the front right side of the car. It struck the center vestibule partition, collapsed it upon the trainman and passenger, and continued into the rear passenger compartment, where it came to rest in the 22nd row of seats, 66 feet from the front of the car.

The 5-ton coil entered the front of the car just to the right of the first coil's point of entry. The second coil dislodged seats along the right front side of the car, crossed the aisle, and came to rest in the ninth row of seats, about 22 feet from the front of the car. (See Figures 4, 5, and 6.)

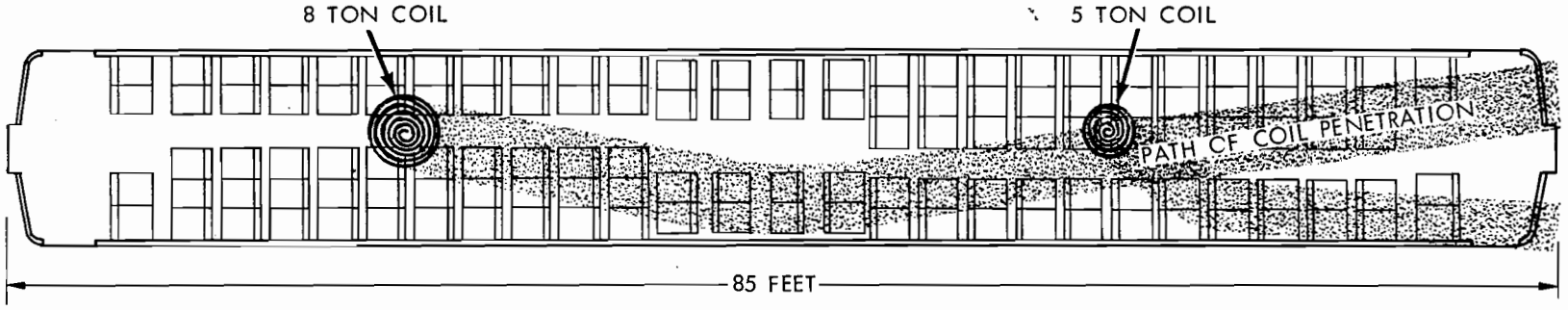
Exterior car components on the right side, to the rear of the center vestibule and below the floor line, were damaged slightly.

The Truck -- The trailer was torn loose from the tractor at the fifth-wheel assembly with only minor damage to the tractor because the fifth wheel separated from the tractor chassis. The trailer was rotated clockwise westward along the track, striking and dislodging the automatic warning signal on the north side of the track. As the trailer rotated off the track and away from the train, it contacted the right side of the train. The trailer came to rest 58 feet west of the crossing, facing the southeast, its left rear corner resting against a catenary pole and its right front corner resting on the ground just clear of the track ballast. The trailer's tandem axle suspension came to rest about 25 feet north of the catenary pole. (See Figure 7.)

The rear third of the right side of the trailer was deformed inward about 14 inches. The trailer frame was twisted badly. Its left rear and right front corners were damaged extensively. The trailer's sliding tandem axle suspension was disengaged from the trailer.

A round puncture, 3 inches in diameter, was found in the trailer's main frame rail on the right side, 8 feet from the rear. This puncture corresponded to the commuter car's protruding coupler horn.

The Signal Equipment -- The automatic warning signal in the northwest quadrant of the grade crossing was struck by the trailer, torn from its base, and damaged extensively as the signal and the trailer were carried westward by the train. The junction box, telegraph relay case, battery well, and a junction box attached to the catenary pole were damaged from impact with the dislodged warning signal and with debris from the trailer.



PLAN VIEW
SEPTA - READING SINGLE COMMUTER CAR AND COIL PENETRATION

Figure 4.

Figure 4. Plan view - Reading Company commuter car and coil penetration.

Figure 5. Interior of railcar 9024 after 8-ton coil penetration.

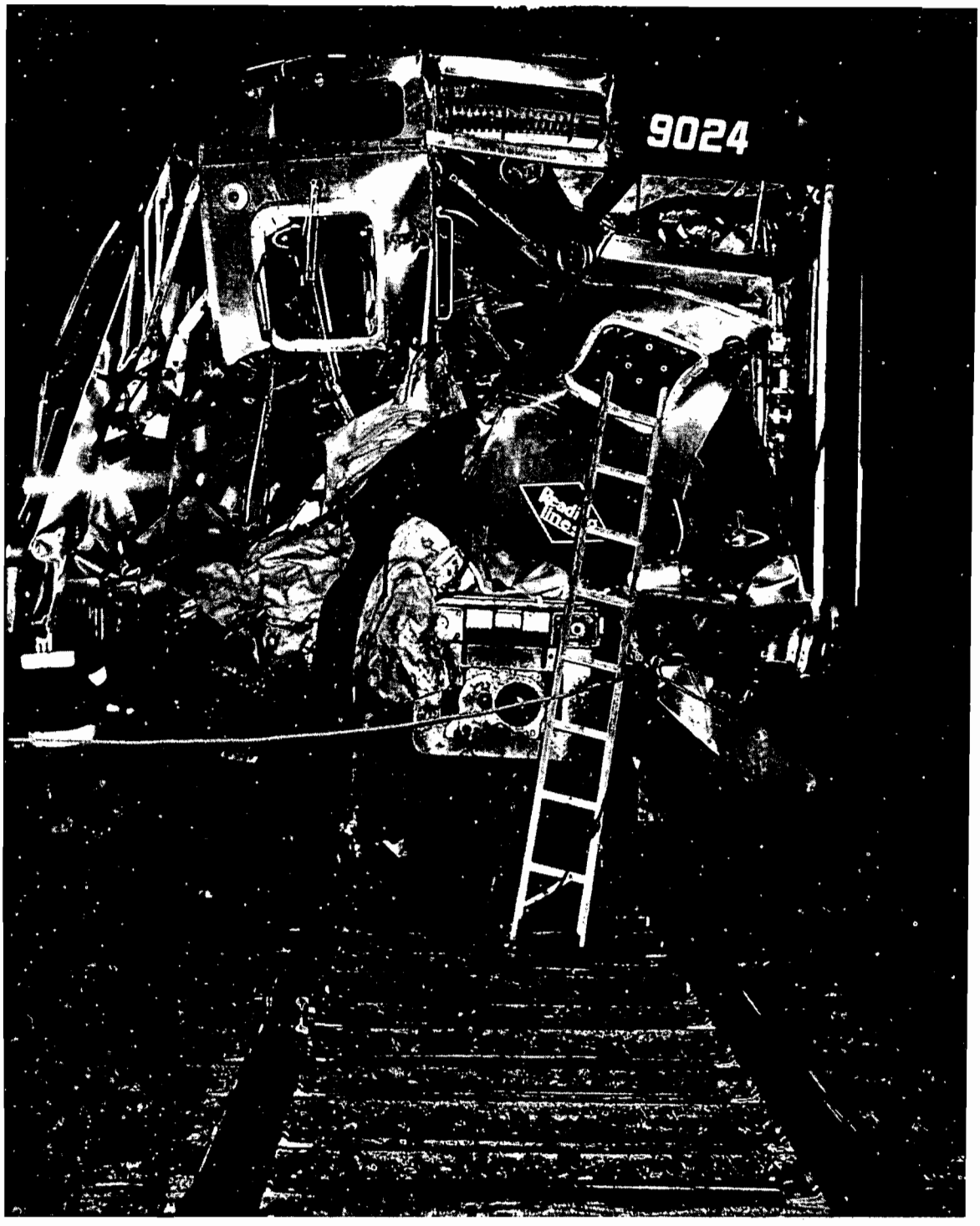


Figure 6. External view of 9024.

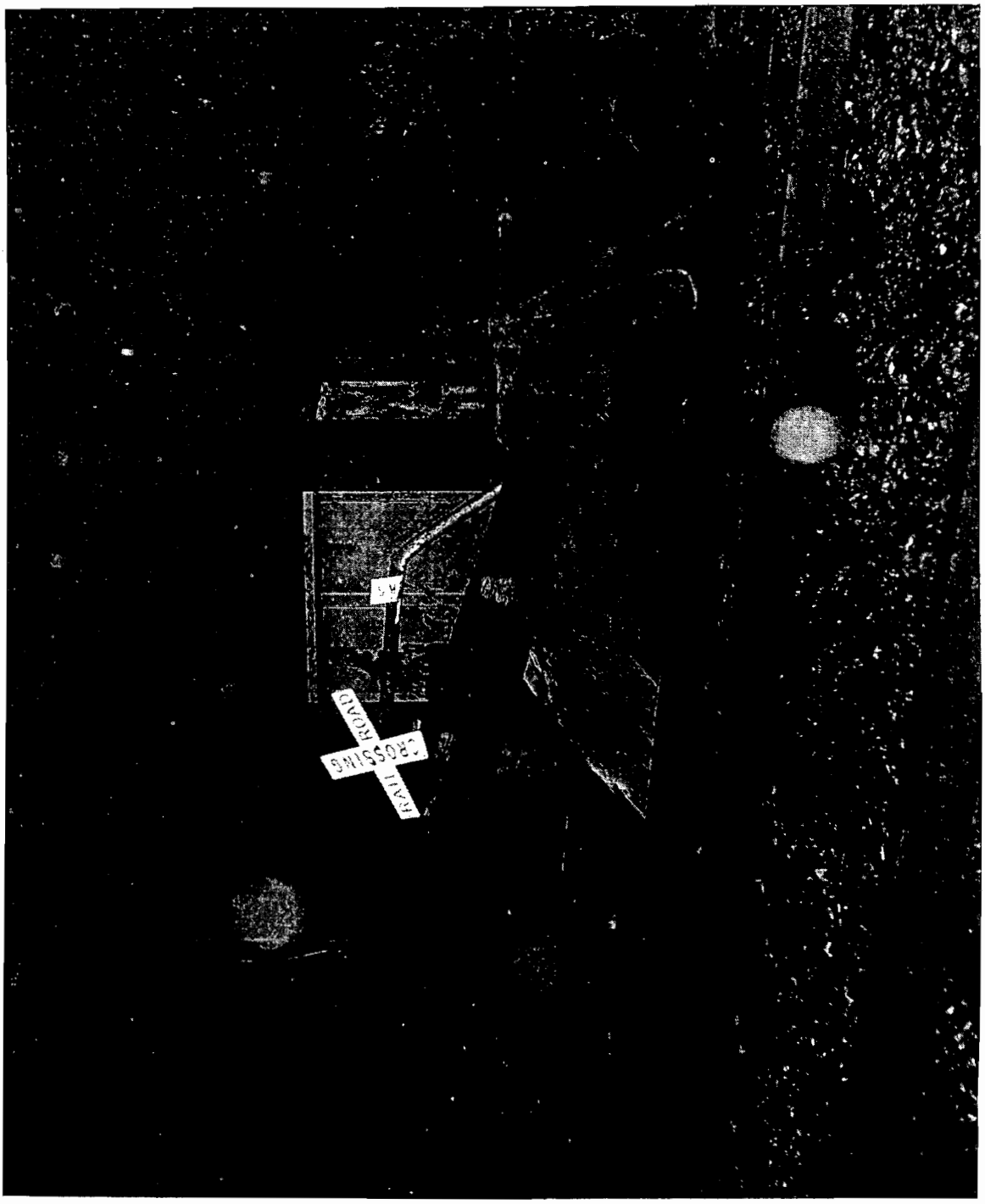


Figure 7. The trailer against catenary pole and highway signal mast

Tests

After the accident, investigators equipped a truck and a train similar in design and load to the accident vehicles.

The train and the truck were moved to their preimpact positions. Investigators recorded visibility and sight distances. Photos then were taken at 1-second intervals from the truckdriver's position, assuming a 15-mph approach to the crossing. Photos also were taken at 1-second intervals from the engineer's position, assuming a 60-mph approach of the train. (See Figure 8.)

The truck and the train made test approaches to the grade crossing. A full-service brake application, utilizing air and dynamic braking, was initiated on the train 100 feet before the crossing when it was moving at 57 mph. The train stopped 1,053 feet beyond the center of the crossing. Therefore, the total stopping distance of the test train is about 1,150 feet.

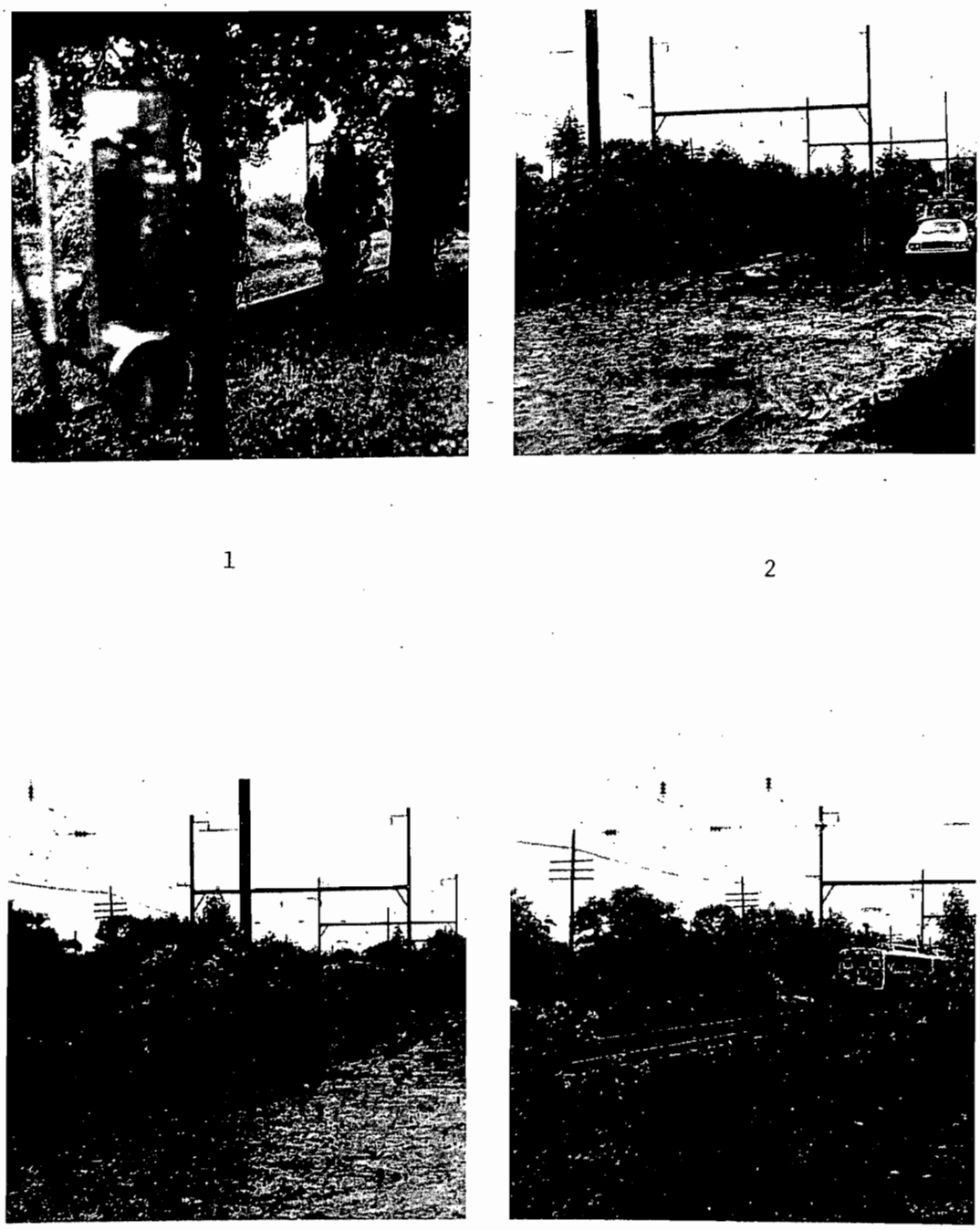
The circuitry of the signal system was tested shortly after the accident by the Federal Railroad Administration (FRA) and by Reading Company signalmen. Except for the flasher damaged in the collision, the system operated as designed. This included the standby battery supply that assures operation if line power is interrupted.

Safety Board investigators examined the damaged flasher and bell and made continuity tests of the damaged wiring and the signaling system. Except for crash damage, they noted no defects. Lamp bulbs were removed from the signaling assembly and examined. The examination disclosed that all of the bulbs were operable except one, which had a broken filament. When the investigators examined the broken filament under a miscroscope, they found that it had failed while it was lit.

ANALYSIS

The train had been operated in compliance with all applicable Reading Company operating rules and the truck met the Federal Bureau of Motor Carrier Safety requirements and the Commonwealth of Pennsylvania requirements. The steel coils were secured on the truck in accordance with motor carrier safety regulations; however, the crash loads in this accident were far greater than those anticipated by the regulations.

The driver testified that "there was absolutely no warning lights whatsoever" and that he did not hear the warning bell or other noise, nor did he see any lights. However, the postaccident inspection of the warning signal system, the laboratory inspection of the bulbs, and the observations of the signals by motorists and railroad employees before and after the collision confirm that the warning devices were indicating the approach of the train.



1 2

3 4

Figure 8. Driver's view of approaching train at selected intervals.

Under Pennsylvania law, a driver must stop when a grade crossing warning signal indicates the approach of a train. However, drivers often do not comply with this law. In this case, the closing speeds of the two vehicles indicate that if the truck had been stopped in compliance with the flashing signal, the train would have passed before the truck could have been started again.

The driver had used this route frequently. Although he may have had an illusion of good track visibility to the east, the vegetation along the right-of-way intermittently obscured the driver's view until the truck was near the track. The vehicle speeds, the darkness, and the adverse weather could have accounted for the driver's failure to see a train approaching from the east.

If a driver assumed he could see the track to the east, and if he did not see a train in that direction, he would have concentrated on the west side, which was more obstructed. The truckdriver probably did not stop because he did not see a train and he did not see the warning device or hear the warning bell or other noise.

This hypothesis suggests that the driver did not stop because he believed the risk of accident was not great. He may have been influenced by environmental factors. His partial view down the track may have increased the likelihood of an accident because it encouraged him to act on the basis of information which was inadequate to make a safe decision.

The large number of passengers at risk in rapid transit trains and commuter trains makes the need for effective grade crossing warning systems evident. Each year, 213 million passengers -- 93 percent of the total rail passenger volume -- are transported by commuter trains which use only 3,070 miles of track, or about 1 percent of the track in the United States. Even the low probability of accidents at grade crossings is unacceptable. If this train had been fully loaded, the number of fatalities would have been large.

It is not feasible to design commuter trains to protect passengers against forces such as those experienced by the train in this accident. Therefore, in order to protect the large number of commuter passengers, grade crossings along commuter and rapid rail routes must be improved.

The Safety Board noted in June 1971 in its "Special Study of Rapid Rail Transit Safety" 2/ that "Grade crossings are not compatible with rail rapid transit operation." The Safety Board is aware of the Department of Transportation's work in grade crossing safety. It notes, however, that there is no program directed specifically at the improvement of grade crossings used by rail commuters. Although commuter trains use only a small

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2/ National Transportation Safety Board, "Special Study of Rapid Rail Transit Safety," June 16, 1971. NTSB-RSS-71-1.

percentage of the total grade crossings, those crossings are the ones at which the largest number of passengers are at risk. Those crossings deserve the highest priority for improvement.

CONCLUSIONS

1. The train was operated in accordance with the operating procedures of the Reading Company.

2. The truck met the Federal Bureau of Motor Carrier Safety's requirements and the Commonwealth of Pennsylvania's requirements concerning satisfactory operating condition.

3. The steel coils were secured on the truck in accordance with motor carrier safety regulations; however, the crash loads in this accident were far greater than those intended by the regulations.

4. The warning device was indicating the approach of the train and was visible to the truckdriver as the truck approached the crossing.

5. The truckdriver did not stop before he entered the crossing.

6. If the driver had stopped in compliance with the flashing lights, the collision would not have occurred.

7. The evidence did not indicate why the driver failed to stop.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the truckdriver to stop the truck in accordance with warning signals.

RECOMMENDATIONS

As a result of its investigation, the National Transportation Safety Board made two recommendations to the Department of Transportation. (See the Appendix.)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ WEBSTER B. TODD, JR.
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ LOUIS M. THAYER
Member

/s/ ISABEL A. BURGESS
Member

/s/ WILLIAM R. HALEY
Member

March 3, 1976

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

APPENDIX

ISSUED:

Forwarded to:

Honorable William T. Coleman, Jr.
Secretary
Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

R-76-13 and R-76-14

About 11:06 p.m. on June 5, 1975, a Reading Company commuter train struck a tractor-semitrailer (truck) at a grade crossing near Yardley, Pennsylvania. The truck was transporting three coils of steel, two of which penetrated the first commuter car. The three occupants of the lead car were killed and an occupant of the second car was injured slightly. The truckdriver was uninjured. The semitrailer was torn from the tractor and damaged beyond repair and the lead commuter car was damaged extensively.

At the time of the collision, the automatic grade crossing signal system was functioning. The truckdriver said he had not seen or heard the warning signals.

Collisions between commuter trains and highway vehicles that can produce many fatalities can be expected wherever the transportation modes intersect at grade crossings. The Safety Board examined this type of collision in its investigation of a 1966 accident at Everett, Massachusetts, 1/ involving a collision of a commuter train with a fuel oil truck, and in a special study 2/ relating to rail rapid transit safety. In the accident report the Safety Board pointed out the incompatibility of commuter rail and highway traffic,

1/ National Transportation Safety Board, "Railroad-Highway Accident Report--Boston and Maine Corporation, Signal Diesel-Powered Passenger Car 563, Collision with Oxbow Transportation Company Tank Truck at Second Street Railroad/Highway Grade Crossing, Everett, Massachusetts, December 28, 1966." February 29, 1968.

2/ National Transportation Safety Board, "Special Study of Rapid Rail Transit Safety," June 16, 1971. NTSB-RSS-71-1.

APPENDIX

and in its special study, the Board recommended eliminating grade crossings on commuter systems. In the accident that occurred at Yardley, three persons in the lead car were killed. If the train had contained more occupants, the loss of life would have been much greater. The potential for catastrophic loss in this class of accident is apparent.

The Safety Board is aware of the Department of Transportation's work in grade crossing safety. However, there is no program directed specifically at the improvement of grade crossings used by rail commuter traffic. Rail commuters use only 3,070 miles of track--1.5 percent of the total rail track; however, they represent 93 percent of the rail passengers. The small percentage of the total railroad-highway grade crossings at which the largest number of rail passengers is at risk deserves high priority for improvement.

Therefore, the National Transportation Safety Board recommends that the Department of Transportation:

1. Require flashing lights and gates as minimum protection at all grade crossings used by commuter trains. (R-76-13) (Class II, Priority Followup)

2. Develop a program directed at the improvement of all grade crossings used by commuter trains. This program should contemplate the separation of grades of all these crossings in the foreseeable future. (R-76-14) (Class III, Longer-Term Followup)

TODD, Chairman, McADAMS, THAYER, BURGESS and HALEY, Members, concurred in the above recommendations.

By: Webster B. Todd, Jr.
Chairman

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