

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

*[Signature]*  
Long H-128

ISSUED: January 12, 1978

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Forwarded to:

Honorable William M. Cox  
Administrator  
Federal Highway Administration  
Washington, D.C. 20590  
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SAFETY RECOMMENDATION(S)

H-77-40 and 41

On August 20, 1976, a tractor-semitrailer leased to the Long Transportation Company (Long) of Detroit, Michigan, went out of control while descending a steep 10-percent grade on State Route 17 in Valley View, Ohio, and collided with 10 automobiles that were stopped at a traffic signal at the bottom of the grade. Eight of the 27 occupants died and 15 were injured. 1/

A post-accident examination of the tractor indicated that it was not equipped with front wheel brakes and that the bogie axle brakes were improperly adjusted. An examination of the brake system on the semitrailer showed that the brake drums were badly scored with significant lips at the drum openings. The four brake shoe anchor pins on the rear tandem axle brakes were rusted or otherwise corroded and were inoperable. This condition prevented any rear tandem axle brake application. The left front-axle wheel bearing was not lubricated. All of the slack adjusters were well beyond the point where they should have been readjusted. Of the eight brakes available on this combination vehicle two were inoperable and the other six were marginal.

1/ For more information about this accident read: "Highway Accident Report--Long Transportation Company Tractor-Semitrailer Collision With Multiple Vehicles, Valley View, Ohio, August 20, 1976," (NTSB-HAR-77-3).

The truckdriver stated that at the top of the grade he was in fifth gear. Witnesses estimated the truck speed halfway down the grade at 45-50 mph. As the vehicle speed exceeded the 31 mph maximum speed for fifth gear, the driver would have to select a higher gear to avoid damaging the tractor engine. After the accident the tractor's transmission was found in neutral and the engine was not damaged internally. It is assumed that in shifting, the driver moved the shift lever into neutral en route to another gear but then due to the increase in speed he was unable to synchronize the transmission input and output shafts into another gear ratio, leaving the transmission in neutral. Such a series of events would have removed any available engine braking capability and left the vehicle's deceleration completely dependent on the defective braking systems.

The existing advance "HILL" warning signs provided no information to the driver concerning the length and steepness of the downgrade ahead. There is no advance signing to warn the driver of the signalized intersection at the foot of the grade.

The curves, trees, and vegetation impeded the truckdriver's perception of the actual roadway conditions. The 4,200 feet of varying downgrades from the crest through the curve to the left did not indicate to the truckdriver that the grade was about to change sharply. Since this was his first trip over this route he probably was not aware of the full magnitude of the 1,600-foot-long 10 percent downgrade until he was nearly upon it.

Trees and bushes close to the edge of the road in the arc of the right curve near the bottom of the downgrade effectively blocked the truckdriver's view of the intersection, the traffic signals, and vehicles stopped at the traffic signal until he was within approximately 500 feet of the intersection, and 200 feet from the rearmost stopped vehicle.

Had the truckdriver been made aware sooner through more informative and pertinent signing to advise of the sharp increase in grade and the presence of the signalized intersection, he may have taken some evasive action rather than maintaining a course along the center of the roadway. Without any advance warning signs to inform him of the intersection and signals, he could have assumed that Granger Road continued on without intersecting roads.

Following this accident, all truck traffic was banned from this section of State Route 17 and rerouted around the steep grade. Such action should preclude the recurrence of future truck accidents involving the loss of braking capability and erroneous transmission manipulation. However, the Valley View Police Department reported that only 35 percent of the average of 68 accidents per year on the Granger Road downgrade involved trucks. Because 65 percent of the accidents involved vehicles other than trucks, it is apparent that a further reduction in accidents might result if all vehicle drivers who are unfamiliar with this road had the benefit of informative advance signing in the area of this accident.

Neither the Ohio Manual on Uniform Traffic Control Devices for Streets and Highways or the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), promulgated by the Federal Highway Administration (FHWA) address the issue of giving more descriptive advice about the length and steepness of grade. Some States use signs which give length and percent of grade information.

Following its investigation of a truck accident at Bishop, California <sup>2/</sup> which involved a loss of braking capability on a long, steep grade, the Safety Board recommended that the FHWA:

"Establish in its adopted Manual on Uniform Traffic Control Devices for Streets and Highways, provisions which require the presentation of critical roadway characteristic information to drivers of commercial or other large vehicles at long/steep grades, and insure application of these provisions through the authority contained within Highway Safety Program 13, Traffic Engineering Service."

The FHWA agreed that some changes were needed in the MUTCD and referred the recommendation to its National Committee. Proposed changes were referred to a task force which is currently considering action to comply with the recommendation. The Safety Board has urged the FHWA to expedite its action in developing and disseminating the necessary changes to provide needed critical roadway information to drivers of heavy vehicles approaching and negotiating long, steep grades.

That section of Granger Road leading up to the point of collision traverses two jurisdictions, namely Garfield Heights and Valley View. The downgrade starts in Garfield Heights about 1 mile east of the Valley View Corporate Limit and ends at Canal Road 1,200 feet west of the corporate limit. The signing with the exception of route and guide signing, is the responsibility of the separate jurisdictions. Neither jurisdiction employs a professional traffic engineer; both primarily depend upon their police to provide signing in conformance with the Ohio Manual on Uniform Traffic Control Devices. This is in compliance with Section 4511.11(A) of the Ohio Revised Code which states:

"Local authorities in their respective jurisdictions shall place and maintain traffic control devices in accordance with the Department of Transportation manual and specifications for a uniform system of traffic control."

Although the traffic signal at the intersection of Granger and Canal Roads is visible for the minimum distance recommended in the Manual on Uniform Traffic Control Devices, it should be noted the minimum

<sup>2/</sup> "Highway Accident Report--Francisco Flores Truck/Pickup Truck Collision, U.S. Route 395, Bishop, California, June 29, 1974," (NTSB-HAR-75-5).

distances specified do not consider the steepness or length of the downgrade of the approach. The long and steep approach at this location, combined with the horizontal curvature, are significant geometric conditions which require warning about the length and degree of steepness of the grade and the presence of the signalized intersection well in advance.

Additional signing concerning the length and steepness of the grade would have to be installed by the city of Garfield Heights. The dynamics of the accidents occurring on this section of road are such that the occurrence initiates on the first part of the grade in Garfield Heights and culminates in Valley View. It would appear that the State of Ohio could better insure that adequate warning signing were installed along such major routes. The State already maintains route markers and guide signs throughout the State highway system and it would appear that a matter as important as hazard signing should be given equal weight. It is recognized that State laws would have to be altered to accommodate the changes.

Highway Safety Program Standard No. 9 (HSPS) "Identification and Surveillance of Accident Locations," requires that each State in cooperation with other local governments shall have a program for identifying accident locations and for maintaining surveillance of those locations having high accident rates or losses.

The program states that it "shall provide, as a minimum, that:

- A. There is a procedure for accurate identification of accident locations on all roads and streets.
  - 1. To identify accident experience and losses on any specific sections of the road and street system.
  - 2. To produce an inventory of
    - a. Highway accident locations.
    - b. Locations where accidents are increasing sharply.
    - c. Design and operating features with which high accident frequencies or severities are associated.
  - 3. To take appropriate measures for reducing accidents.
  - 4. To evaluate the effectiveness of safety improvements on any specific section of the road and street system.
- B. There is a systematically organized program
  - 1. To maintain continuing surveillance of the roadway network for potentially high accident locations.
  - 2. To develop methods for their correction."

The State procedure for accurate identification of accident locations on Granger Road is not complied with by Valley View and as a result, the State has been unable to pinpoint the locations of accidents reported to them. Both the State Regional Traffic Engineer and the city of Valley View recognize a high accident location problem. However, the lack of positive

location identifiers in the State system has prevented the State from properly referencing the data in their computer files and fitting the area into their priority improvement program. This is not an uncommon deficiency in the State of Ohio.

The FHWA administers HSPS No. 9 and should review Ohio's compliance with the Standard with the goal of developing and implementing a procedure at the local level which will overcome this deficiency. The provisions of this standard, when related to the available accident record, suggests that corrective measures may have resulted several years before the occurrence of this accident had Program Standard No. 9 been followed.

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

Require the State of Ohio to renew its emphasis toward the implementation at the local level of established procedures for the accurate identification of accident locations on all roads and streets, as outlined in Highway Safety Program Standard No. 9, Chapter 7, Section 3A, B, and C. (Class II, Priority Action) (H-77-40)

Require local jurisdictions to obtain State approval before installing traffic control devices on State routes through their jurisdictions. (Class II, Priority Action) (H-77-41)

BAILEY, Acting Chairman, McADAMS, HOGUE, and KING, Members, concurred in the above recommendations.



By: Kay Bailey  
Acting Chairman



NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

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Log H-129  
JR

ISSUED: January 12, 1978

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Forwarded to:

Honorable Brock Adams  
Secretary  
Department of Transportation  
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

H-77-42

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On August 20, 1976, a tractor-semitrailer leased to the Long Transportation Company (Long) of Detroit, Michigan, was descending a steep grade in Valley View, Ohio, when it collided with 10 automobiles that were stopped at a traffic signal at the bottom of the grade. Eight of the 27 automobile occupants died and 15 were injured. 1/

The tractor, a semitrailer, and the services of a driver, (the owner-operator) had been trip leased to Long (one trip) by Frostways, Inc., (Frostways) of Detroit. According to the Long Manifest and Trip Lease, the accident tractor and a Brown semitrailer were presented to Long for its pre-lease inspection in South Kearney, New Jersey. No discrepancies were noted for either vehicle. According to the truckdriver's daily logs, he drove to Stamford, Connecticut, picked up the Long cargo and headed for Detroit. When the accident occurred in Valley View, the tractor was pulling a Trailmobile semitrailer which was leased to Frostways, not the Brown semitrailer identified in the Manifest and Trip Lease. Long informed the Safety Board that the Manifest and Trip Lease had been prepared for the wrong semitrailer. This discrepancy was not noticed at the time of the pre-lease inspection.

1/ For more information about this accident read: "Highway Accident Report---Long Transportation Company Tractor-Semitrailer Collision With Multiple Vehicles, Valley View, Ohio, August 20, 1976," (NTSB-HAR-77-3).

A post-accident examination of the tractor indicated that it was not equipped with front wheel brakes and that the bogie axle brakes were improperly adjusted. An examination of the brake system on the semitrailer showed that the brake drums were badly scored with significant lips at the drum openings. The four brake shoe anchor pins on the rear tandem axle brakes were rusted or otherwise corroded and were inoperable. This condition prevented any rear brake application. The left front-axle wheel bearing was not lubricated. All of the slack adjusters were well beyond the point where they should have been readjusted. Of the eight brakes available on this combination vehicle, two were inoperable and the other six were marginal.

Frostways could produce no maintenance records for either the tractor or the semitrailer. It was determined that the brake shoes on the tractor were those originally installed by the manufacturer. Even though the tractor had been driven more than 68,000 miles, the linings showed relatively minor wear. The condition of the rear-axle brakes on the semitrailer indicates that neither pretrip inspections by the driver nor preventive maintenance by the carrier had been conducted recently. Had Long conducted a complete pre-lease inspection the discrepancy in the vehicle identification on the Manifest and Trip Lease would have been discovered. During a proper inspection the improperly adjusted and partially inoperable brake systems should have been discovered and corrected. If the truckdriver had conducted a proper pretrip inspection, found the marginal brake adjustments on the tractor and inoperable brakes on the semitrailer, and refused to drive the unsafe vehicle as provided for by Federal Motor Carrier Safety Regulation 49 CFR 392.7, the accident could have been avoided. Also, if Frostways had conducted the preventive maintenance programs required by 49 CFR 396.2, the condition of the tractor and semitrailer brake systems would have been discovered and corrected prior to the trip lease to Long.

The Safety Board realizes that the Bureau of Motor Carrier Safety (BMCS) has limited resources for commercial vehicle inspections. As a result of these limitations the BMCS was able to inspect less than 1 percent of the estimated 4 million interstate commercial vehicles in 1975. 2/ In 1975 there was only one safety inspector for every 32,000 interstate commercial vehicles. 3/

2/ Report to the Congress by the Comptroller General of the United States, May 6, 1977: "The Federal Motor Carrier Safety Program: Not Yet Achieving What the Congress Wanted."

3/ Ibid.

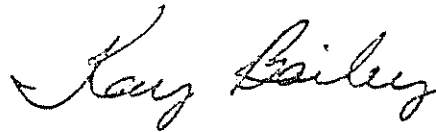


Therefore the National Transportation Safety Board recommends that the U. S. Department of Transportation:

Seek the necessary funding from the Congress to increase the resources of the Federal Bureau of Motor Carrier Safety to enable it to increase its activities devoted to the roadside inspection of commercial motor vehicles and the safety compliance survey of carrier operations. (Class II, Priority Action) (H-77-42)

The Safety Board will assist in any way possible with information for your budget request.

BAILEY, Acting Chairman, McADAMS, HOGUE, and KING, Members, concurred in the above recommendation.

A handwritten signature in cursive script, reading "Kay Bailey".

By: Kay Bailey  
Acting Chairman

