



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 23, 2004

In reply refer to: H-04-04

Mr. John L. Craig
Director
Nebraska Department of Roads
Post Office Box 94759
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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses work zone safety and management. The recommendation is derived from the Safety Board's investigation of an October 13, 2001, work zone accident¹ involving a school bus that plunged off the West Papillion Creek Bridge in Omaha, Nebraska, and is consistent with the evidence it found and the analysis it performed. As a result of this investigation, the Safety Board has issued seven safety recommendations, one of which is addressed to the Nebraska Department of Roads. Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement this recommendation.

On Saturday, October 13, 2001, about 2:00 p.m. central daylight time, a 2000 Thomas Built Buses, Inc., 78-passenger school bus carrying 27 Seward High School students and 3 adults (excluding the driver) was traveling westbound through a work zone on U.S. Route 6 in Omaha, Nebraska. As the Seward bus entered the work zone lane shift at the approach to the West Papillion Creek Bridge, it encountered a 1986 Motor Coach Industries 52-passenger motorcoach carrying Norfolk High School students traveling eastbound. Although no collision occurred between the Norfolk and Seward buses, the westbound school bus departed the traveled roadway on the right and subsequently struck the W-beam barrier on the approach to the bridge, steered to the left momentarily, and then steered abruptly back to the right, striking the W-beam again and, finally, a three-rail barrier between the guardrail and the concrete bridge railing. The bus passed

¹ For more information, read National Transportation Safety Board, *School Bus Run-Off Bridge Accident, Omaha, Nebraska, October 13, 2001*, Highway Accident Report NTSB/HAR-04/01 (Washington, DC: NTSB, 2004).

through the remains of the three-rail barrier, rode up onto the bridge's sidewall, and rolled 270 degrees clockwise as it fell about 49 feet, landing on its left side in a 1-foot-deep creek below the bridge. Three students and one adult sustained fatal injuries. The remaining passengers and the busdriver sustained injuries ranging from serious to minor.

The National Transportation Safety Board determined that the probable cause of this accident was the failure of the Nebraska Department of Roads (NDOR) to recognize and correct the hazardous condition in the work zone created by the irregular geometry of the roadway, the narrow lane widths, and the speed limit. Contributing to the accident was the accident bus driver's inability to maintain the bus within the lane due to the perceived or actual threat of a frontal collision with the approaching eastbound motorcoach and the accident bus driver's unfamiliarity with the accident vehicle. Contributing to the severity of the accident was the failure of the traffic barrier system to redirect the accident vehicle.

Work zone management in the accident vicinity was governed by a "generic" traffic control plan, as was allowed by the 1988 *Manual on Uniform Traffic Control Devices* (MUTCD).² NDOR relied upon its district construction engineer, project manager, and project assistants to ensure that the contractor in charge of the U.S. 6 construction project complied with this generic traffic control plan. However, none of these NDOR employees had specific or general training in traffic engineering. Further, the American Traffic Safety Services Association (ATSSA) training that these employees reportedly received did not include the depth of traffic operations and safety engineering training necessary to manage and make traffic engineering control decisions for a large construction project. NDOR acknowledged that traffic engineering office staff did not monitor traffic accident experience in work zones or periodically inspect work zones beyond the annual inspections required by the Federal Highway Administration (FHWA). The general contractor's project management personnel also had no training in construction work zone safety. The general contractor contracted with a "safety consultant," but this person's duties related to workers' occupational safety, not traffic safety or operations.

As required by the FHWA, NDOR conducted random, statewide work zone traffic control reviews annually. In 1999, a team of FHWA and NDOR engineers traveled approximately 2,000 miles in 4 days to review some 50 Nebraska work zones.³ Merely traveling 2,000 miles in 4 days would require about 33 hours (at an average driving speed of 60 mph). Assuming 12-hour workdays, with no breaks, would leave only 15 hours to inspect 50 projects, about 18 minutes per project. Such figures call into question the thoroughness of the FHWA-required inspections and the accuracy of the resulting statistics.

A subsequent FHWA-NDOR work zone review on July 26, 2001, rated the work zone on U.S. 6 (West Dodge Road) as "fair" for 2001. The inspection report mentioned only minor signage discrepancies; it failed to mention the following instances of nonconformance with FHWA policy and MUTCD guidelines:

- Two-lane, two-way operation in an area where road users could not see from one end of the operation to the other and the posted speed limit was 45 mph.

² MUTCD, 1988 edition, chapter 6 (revision 3-1992).

³ Study of Work Zone Crashes in Nebraska prepared by FHWA and NDOR, August 1999.

- Lack of traffic control training for the individuals apparently responsible for monitoring the safety effectiveness of the traffic control plan.
- Failure to monitor reported traffic accidents in the work zone.
- Failure to document the lack of a buffer space and barriers between the work and traffic space.
- Failure to document the May 15, 2001, damage to the barrier transition on the northeast corner of the West Papillion Creek Bridge caused by an earth-moving truck and the barrier's subsequent inadequate repair.

Traffic control needs and safety hazards in construction work areas can change frequently as a project progresses. A feature that might not have been hazardous one day can become a danger the next day. Properly trained and vigilant construction supervision personnel can correct hazardous conditions or request assistance from the State traffic engineering office or from the American Association of State Highway and Transportation Officials. In this instance, construction engineering and supervision personnel with training in traffic engineering and work zone traffic control would probably have recognized that this project did not comply with MUTCD guidelines and other traffic safety guidance. The Safety Board concluded that because inspections of U.S. 6 required and evaluated by the FHWA and executed by NDOR personnel were inadequate, several hazardous conditions either developed, were left uncorrected, or both. For example, following the May 2001 damage caused by the earth-moving truck, the contractor had supposedly repaired the barrier system struck by the earth-moving vehicle, but not to any accepted standard of performance. The repair resulted in the W-beam not being secured at its west end, and, therefore, it lacked the strength provided by tension from another structure. This allowed the W-beam to act like a "swinging door" and be pushed aside when it was struck by the school bus and thus contributed to the severity of the accident.

As a result of this accident the Safety Board will recommend that the FHWA strengthen its criteria for work zone monitoring, to include requiring its divisional offices to participate in the States' work zone safety inspections and to diligently monitor and evaluate the results of those inspections.

Also key to effective work zone management is monitoring the work area's traffic accident experience so that potential hazards can be corrected. But work zone traffic accident records can be monitored effectively only if reports are acquired in a timely manner, directly from local and State traffic law enforcement agencies. Waiting for the reports to be sent to the State through normal channels can take months, a delay that renders them almost useless for the timely identification of hazards.

The National Transportation Safety Board therefore recommends that the Nebraska Department of Roads:

Initiate a program to obtain work zone traffic accident reports from law enforcement agencies monthly and analyze these data to aid in identifying and eliminating hazards as they develop. (H-04-04)

The Safety Board also issued safety recommendations to the Federal Highway Administration, Omaha Fire Department, National Association of State Directors of Pupil Transportation Services, and Thomas Built Buses, Inc. In response to the recommendation in this letter, please refer to H-04-04. If you need additional information, you may call (202) 314-6607.

Chairman ENGLEMAN CONNERS, Vice Chairman ROSENKER, and Members CARMODY, GOGLIA, and HEALING concurred with this recommendation.

By: Ellen Engleman Connors
Chairman