

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**Public Meeting of November 17, 2015**  
**(Information subject to editing)**

Truck-Tractor Semitrailer Median Crossover Collision With Medium-Size Bus  
on Interstate 35, Davis, Oklahoma  
September 26, 2014

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing.

## **Executive Summary**

On September 26, 2014, about 9:05 p.m., a 2013 Peterbilt truck-tractor in combination with a 2014 Great Dane semitrailer, operated by Quickway Transportation Inc., was traveling north in the left lane of Interstate 35 (I-35), near Davis, Oklahoma. About the same time, a 2008 Champion Defender 32-passenger medium-size bus—transporting 15 members of the North Central Texas College (NCTC) softball team—was traveling south in the right lane of I-35. The college owned and operated the bus.

In the vicinity of milepost 47, after negotiating a slight rightward curve at a speed of about 72 mph, the truck-tractor departed the left lane and entered the 100-foot-wide depressed earthen median at an approximate 2 degree angle. The truck-tractor continued through the median, traveling over 1,100 feet without evidence of braking or steering. The combination vehicle then entered the southbound lanes of I-35 at an approximate 9 degree angle and collided with the bus.

Following the impact, the bus rolled onto its right side, and the truck-tractor continued off the roadway into a wooded area. As a result of the crash, four passengers on the bus were fully or partially ejected and died, and both drivers and the remaining passengers were injured.

The crash investigation focused on the following safety issues:

- ***Truck driver's drug use:*** The truck driver's use of synthetic cannabinoids (SC) was identified as a safety issue based on his toxicology results, his lack of corrective action as he departed the roadway, and his history of drug use. Research is needed on the extent of SC use among commercial motor vehicle (CMV) drivers. Federal regulations specifying the drugs for which CMV drivers are tested include only a limited number of drugs. The inconsistency between the drug-testing regulations and

the stated ban on the use of any impairing substances while driving, including SCs, should be resolved.

- ***Passenger restraint systems:*** The medium-size bus was equipped with seat belts, but none of the passengers wore the restraints. Although the NCTC had a seat belt use policy, it was not enforced. Moreover, motorcoaches and medium-size buses are excluded from state seat belt use laws, whether with primary or secondary enforcement. The Davis crash demonstrates the need for seat belt use laws with primary enforcement for all vehicles.
- ***Crashworthiness of medium-size buses:*** Currently, for medium-size buses, there are no crashworthiness standards for side impact and occupant crash protection. The level of injury among bus occupants would have been reduced if the accident bus had met the current and future federal standards for large buses—for occupant protection and for rollover structural integrity. Further, side impact protection standards would enhance the crashworthiness of medium-size buses.
- ***Vehicle data recording:*** The truck-tractor was equipped with two recording devices, but neither module was a dedicated event data recorder. The medium-size bus had no such recording systems. With critical crash data on driver inputs and vehicle dynamics, investigators and researchers would be better able to understand crashes, leading to improvements in safety.
- ***Median barriers:*** No median barrier was in place at the crash site. Certain states—including Oklahoma—have developed more advanced guidelines for the installation of median cable barrier, leading to reduced crossover crashes and fatalities. Such guidelines and the circumstances of this crash can provide critical information in the development of comprehensive state or national guidelines for the installation of median barriers.

As a result of this investigation, the NTSB makes new safety recommendations to the Federal Motor Carrier Safety Administration; the National Highway Traffic Safety Administration (NHTSA); the Federal Highway Administration (FHWA); the 50 states, the District of Columbia, and Puerto Rico; and the American Trucking Associations; American Bus Association; United Motorcoach Association; Owner-Operator Independent Drivers Association; Commercial Vehicle Safety Alliance; and American Association of Community Colleges. The NTSB also reiterates five recommendations to NHTSA, and two recommendations each to the FHWA and to the American Association of State Highway and Transportation Officials; and reclassifies one recommendation to the governors and legislatures of the 50 states, the US Territories, and the District of Columbia.

## **Findings**

1. None of the following were primary or contributory factors in the crash: (1) truck or bus driver licensing and driving experience; (2) bus driver distraction due to cell phone use,

fatigue, substance abuse, or medical conditions; (3) motor carrier operations; (4) mechanical condition of either vehicle; (5) traffic hazards; or (6) weather conditions.

2. Although the emergency response deviated from National Incident Management System and incident command system protocols in some instances, and there was a delay in the transportation of one injured passenger, these circumstances did not affect the extent of the injuries to the occupants of either vehicle.
3. The truck driver's claim that he was reaching for a soft drink cannot account for his lack of corrective action following the roadway departure.
4. The lack of any type of evasive steering or braking by the truck driver while traveling across the median for more than 10 seconds—and the full throttle following impact with the medium-size bus—are inconsistent with a fatigue-related crash.
5. The truck driver's lack of corrective actions following the roadway departure was due to incapacitation, likely from the use of synthetic cannabinoids.
6. There is a disconnect in the regulations between the drug prohibitions for commercial motor vehicle drivers, found at 49 *Code of Federal Regulations (CFR)* 392.4, and the substances for which they are screened, found at 40 *CFR* 40.85.
7. Research is needed on the extent to which commercial motor vehicle drivers use impairing substances, particularly synthetic cannabinoids and other substances not tested for under 49 *Code of Federal Regulations* 40.85.
8. The incongruity between the trained visual detection of impairment and the results of drug and alcohol tests indicates a need for improved methods of addressing driver impairment.
9. To reduce the likelihood of drug-impaired driving, motor carriers should educate their drivers about the dangers of synthetic drugs.
10. The lack of seat belt use likely exacerbated the injuries of passengers in the medium-size bus.
11. Although North Central Texas College had a policy requiring that drivers operate vehicles only if all passengers were wearing their seat belts, the accident driver did not ensure that his passengers were wearing the available seat belts; and the college had no procedure in place to ensure that its drivers complied with the policy.
12. Junior colleges can improve transportation safety by following the travel policy guidelines developed by the National Collegiate Athletic Association.
13. Extending the mandatory seat belt use laws with primary enforcement to all vehicles in all states for all seating positions would decrease fatalities on the road.

14. The crashworthiness of medium-size buses can be improved by requiring those vehicles to meet the existing motorcoach occupant protection standards and the proposed rollover structural integrity standard.
15. Because of the current lack of side-impact protection standards for medium-size buses, occupants are at risk of injury and ejection during side-impact crashes.
16. Because of a power loss during the collision sequence, the truck-tractor engine electronic control unit did not record useful vehicle parameter data.
17. The driver of the truck-tractor applied near full throttle for 1.5–2 seconds between colliding with the medium-size bus and striking the trees.
18. Because of the continued lack of standards and requirements for event data recorders in trucks and buses over 10,000 pounds gross vehicle weight rating, data that are crucial to the improved understanding of crashes, as well as to overall vehicle safety, continue to go unrecorded.
19. The advanced state median cable barrier guidelines, which allow for installing barriers at locations where they were not previously considered, can help reduce the frequency of median crossover crashes.
20. The circumstances of the median crossover crash in Davis, Oklahoma, together with the Oklahoma Department of Transportation median cable barrier guidelines, could provide state departments of transportation with critical information to take provisional steps before the completion of National Cooperative Highway Research Program project 22-31.

## **PROBABLE CAUSE**

The National Transportation Safety Board determines that the probable cause of the Davis, Oklahoma, crash was the failure of the truck-tractor driver to control his vehicle due to incapacitation likely stemming from his use of synthetic cannabinoids. Contributing to the severity of injuries was the lack of restraint use by the bus passengers and the lack of appropriate crashworthiness standards for medium-size buses.

## **RECOMMENDATIONS**

As a result of its investigation, the National Transportation Safety Board makes the following safety recommendations.

## **New Recommendations**

### **To the Federal Motor Carrier Safety Administration:**

1. Determine the prevalence of commercial motor vehicle driver use of impairing substances, particularly synthetic cannabinoids, and develop a plan to reduce the use of such substances. (H-15-XX)
2. Work with motor carrier industry stakeholders to develop a plan to aid motor carriers in addressing commercial motor vehicle driver use of impairing substances, particularly those not covered under current drug-testing regulations—such as promoting best practices by carriers, expanding impairment detection training and authority, and developing performance-based methods of evaluation. (H-15-XX)

### **To the National Highway Traffic Safety Administration:**

3. Develop, and require compliance with, a side-impact protection standard for all newly manufactured medium-size buses, regardless of weight. (H-15-XX)

### **To the Federal Highway Administration:**

4. Disseminate information to the state departments of transportation about the circumstances of the Davis, Oklahoma, crash and the Oklahoma Department of Transportation revised median cable barrier guidelines that resulted in the installation of a median cable barrier at the crash site. (H-15-XX)

### **To the 50 states, the District of Columbia, and Puerto Rico:**

5. Enact legislation that provides for primary enforcement of a mandatory seat belt use law for all vehicle seating positions equipped with a passenger restraint system. (H-15-XX) (Supersedes Safety Recommendation H-97-2)

### **To the American Trucking Associations, American Bus Association, United Motorcoach Association, Owner-Operator Independent Drivers Association, and Commercial Vehicle Safety Alliance:**

6. Inform your members about the dangers of driver use of synthetic drugs and encourage them to take steps to prevent drivers from using these substances. (H-15-XX)

### **To the American Association of Community Colleges:**

7. Urge your members to adopt and follow the National Collegiate Athletic Association's *Safety in Student Transportation: A Resource Guide for Colleges and Universities*. (H-15-XX)

## **Reiterated Recommendations**

The National Transportation Safety Board also reiterates the following safety recommendations:

### **To the National Highway Traffic Safety Administration:**

Develop and implement, in cooperation with other government agencies and industry, standards for on-board recording of bus crash data that address, at a minimum, parameters to be recorded, data sampling rates, duration of recording, interface configurations, data storage format, incorporation of fleet management tools, fluid immersion survivability, impact shock survivability, crush and penetration survivability, fire survivability, independent power supply, and ability to accommodate future requirements and technological advances. (H-99-54)

In your rulemaking to improve motorcoach roof strength, occupant protection, and window glazing standards, include all buses with a gross vehicle weight rating above 10,000 pounds, other than school buses. (H-10-3)

Require that all buses above 10,000 pounds gross vehicle weight rating be equipped with on-board recording systems that: (1) record vehicle parameters, including, at minimum, lateral acceleration, longitudinal acceleration, vertical acceleration, heading, vehicle speed, engine speed, driver's seat belt status, braking input, steering input, gear selection, turn signal status (left/right), brake light status (on/off), head/tail light status (on/off), passenger door status (open/closed), emergency door status (open/closed), hazard light status (on/off), brake system status (normal/warning), and flashing red light status (on/off; school buses only); (2) record status of additional seat belts, airbag deployment criteria, airbag deployment time, and airbag deployment energy; (3) record data at a sampling rate sufficient to define vehicle dynamics and be capable of preserving data in the event of a vehicle crash or an electrical power loss; and (4) are mounted to the bus body, not the chassis, to ensure recording of the necessary data to define bus body motion. (H-10-7)

Develop and implement minimum performance standards for event data recorders for trucks with gross vehicle weight ratings over 10,000 pounds that address, at a minimum, the following elements: data parameters to be recorded; data sampling rates; duration of recorded event; standardized or universal data imaging interface; data storage format; and device and data survivability for crush, impact, fluid exposure and immersion, and thermal exposure. The standards should also require that the event data recorder be capable of capturing and preserving data in the case of a power interruption or loss, and of accommodating future requirements and technological advances, such as flashable and/or reprogrammable operating system software and/or firmware updates. (H-10-14)

After establishing performance standards for event data recorders for trucks with gross vehicle weight ratings over 10,000 pounds, require that all such vehicles be equipped with event data recorders meeting the standards. (H-10-15)

**To the Federal Highway Administration:**

Work with the American Association of State Highway and Transportation Officials to identify cross-median crash rates that call for special consideration when selecting median barriers. (H-11-22)

Work with the American Association of State Highway and Transportation Officials to define the criteria for median barrier selection, including heavy vehicle traffic volume. (H-11-23)

**To the American Association of State Highway and Transportation Officials:**

Work with the Federal Highway Administration to identify cross-median crash rates that call for special consideration when selecting median barriers, and publish the rates in the *Roadside Design Guide*. (H-11-32)

Work with the Federal Highway Administration to define the criteria for median barrier selection, including heavy vehicle traffic volume, and publish the criteria in the *Roadside Design Guide*. (H-11-33)

**Previously Issued Recommendations Reclassified in This Report**

The National Transportation Safety Board reclassifies Safety Recommendation H-97-2 from its current classification of “Open—Acceptable Alternate Response” to “Closed—Superseded” in section 2.4.3, “State Level Seat Belt Use Laws,” of this report (superseded by Safety Recommendation [5] H-15-XX).

**To the governors and legislatures of the 50 states, the US Territories, and the District of Columbia:**

Enact legislation that provides for primary enforcement of mandatory seatbelt use laws, including provisions such as the imposition of driver license penalty points and appropriate fines. Existing legal provisions that insulate people from the financial consequences of not wearing a seatbelt should be repealed. (H-97-2)