

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**Public Meeting of June 18, 2019**  
**(Information subject to editing)**

**School Bus Run-Off-Road and Fire**  
**Oakland, Iowa**  
**December 12, 2017**  
**HWY18MH003**

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 to reflect changes adopted during the Board meeting.

## **Executive Summary**

On December 12, 2017, just before 6:50 a.m. central standard time, a 2004 International 65-passenger school bus, operated by the Riverside Community School District, was traveling south on rural 480th Street outside Oakland, Iowa. The bus driver turned right onto a residential driveway for the first student pickup on his route. After the 16-year-old female student boarded, the driver reversed out of the driveway, as was his normal practice for the location, backed across 480th Street, and continued reversing until the bus's rear wheels ran off the road and dropped into a 3-foot-deep ditch next to the road. While the driver was attempting to drive the bus out of the ditch, a fire began in the engine compartment and spread throughout the bus. The driver and the 16-year-old passenger died in the fire.

The investigation focused on the following safety issues:

- School bus driver fitness for duty, including physical performance tests and driver oversight by the Riverside Community School District.
- School bus fire safety, including fire suppression systems, fire-resistant interior materials, and federal fire safety performance standards.
- School bus emergency training, including evacuation drills and equipment.

## **Findings**

1. None of the following were factors in the crash: (a) school bus mechanical condition; (b) driver licensing, experience, alcohol or other illicit drug impairment, fatigue, or distraction; (c) roadway design or conditions; and (d) weather conditions.
2. The emergency response to the crash and fire by local fire departments and law enforcement was adequate and timely.

3. The driver failed to control the school bus and prevent the run-off-road crash for reasons that cannot be determined from the available information.
4. The likely origin of the fire was the exterior of the turbocharger in the engine compartment.
5. The blocked exhaust pipe, resulting in turbocharger overload with significant heat output during repeated engine acceleration, was the primary contributing factor to the initiation of the fire.
6. Fluids in the engine compartment fueled the fire, but the initial fuel source could not be determined because of the extensive damage to the engine compartment.
7. The passenger was possibly attempting to assist the school bus driver, whose limited mobility due to medical conditions might have prevented him from evacuating the bus, and she did not perceive the immediate danger before being overcome by smoke and superheated gases as a result of the fire.
8. Although the school bus driver had progressive chronic pain and stable mild right dorsal flexion leg weakness, there was no evidence that the driver's back pain or leg weakness or other medical conditions and medications, including the drug gabapentin, would have affected his ability to perform the driving functions required (while sitting) to operate the school bus.
9. It is likely that the bus driver's progressive chronic back disease, which caused severe chronic pain, impaired his ability to evacuate the school bus himself or to assist the passenger to evacuate.
10. The use of physical performance tests on both a routine and an as-needed basis can help identify physically unfit drivers who have a valid medical certificate but who might not be able to perform required safety duties, especially in an emergency.
11. If the Riverside Community School District had adhered to the requirements of its transportation policy regarding the physical abilities of school bus drivers and had not allowed the accident driver to operate a bus until he was medically cleared and fit for duty (or could pass a physical performance test), the fatal outcome of what should have been a survivable run-off-road, low-speed crash might have been avoided.
12. The Riverside Community School District exercised poor oversight of driver safety by allowing a driver with known, significantly limited mobility to operate a school bus and by not removing a driver from duty who was unable to perform required safety duties.
13. Awareness training for Iowa school district personnel, including but not limited to bus drivers, transportation directors, supervisors, and superintendents, would increase awareness of the federal and state regulations regarding commercial driver fitness and the avenues available for reporting drivers who have medical conditions that might make it unsafe for them to operate a school bus.

14. A fire suppression system in the engine compartment could have prevented the fire from spreading into the passenger compartment.
15. The lack of a complete firewall between the school bus engine compartment and the passenger compartment led to the rapid spread of superheated gases, smoke, and fire into the passenger compartment; and the interior components of the bus were flammable when exposed to ignition sources greater than those used in tests under Federal Motor Vehicle Safety Standard 302 and in fire block tests.
16. The Oakland fire, along with other school bus fires reported nationally and as shown in school bus fire demonstrations, illustrates that once a school bus compartment is breached (even when an exterior fire enters the bus), a fire spreads quickly, and smoke, toxic gases, and heat make the interior untenable for occupancy.
17. The school bus driver's decision to use the radio to call the bus transportation supervisor instead of activating the 911 emergency button delayed notification to emergency responders.
18. Emergency training, including training on how to conduct emergency drills with students, is a vital safety exercise that should be incorporated into the annual training curriculum for school bus drivers.
19. Despite the front-loading door being the often-used first means of egress, students might not be trained in how to evacuate through a manually operated loading door if their driver becomes incapacitated.

## **Probable Cause**

The National Transportation Safety Board (NTSB) determines that the probable cause of the fatal school bus run-off-road and fire in Oakland, Iowa, was (1) the driver's failure to control the bus, backing it into a roadside ditch for reasons that could not be established; and (2) the failure of the Riverside Community School District to provide adequate oversight by allowing a driver to operate a school bus with a known physical impairment that limited his ability to perform emergency duties. The probable cause of the fire was ignition of a fuel source on the exterior of the engine's turbocharger due to turbocharger overload and heat production, resulting from the blockage of the exhaust pipe by the bus's position in the ditch and the driver's attempts to accelerate out of the ditch. Contributing to the severity of the fire was the spread of flames, heat, and toxic gases from the engine into the passenger compartment through an incomplete firewall.

## **Recommendations**

### **New Recommendations**

#### **To the US Department of Transportation:**

1. Require in-service school buses to be equipped with fire suppression systems that at a minimum address engine fires.

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

2. Require all new school buses to be equipped with fire suppression systems that at a minimum address engine fires.
3. Develop standards for newly manufactured school buses, especially those with engines that extend beyond the firewall, to ensure that no hazardous quantity of gas or flame can pass through the firewall from the engine compartment to the passenger compartment.

**To the states of Alabama, Alaska, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, Wisconsin, and Wyoming; the commonwealths of Kentucky, Massachusetts, Pennsylvania, and Virginia; the District of Columbia; and the territory of Puerto Rico:**

4. Revise your school bus driver requirements so that all drivers must pass a physical performance test on hiring and at least annually, and also whenever a driver's physical condition changes in a manner that could affect his or her ability to physically perform school bus driver duties, including helping passengers evacuate a bus in an emergency.

#### **To the state of Iowa:**

5. Inform your school districts of the circumstances of the Oakland school bus crash and fire and the lessons learned from the investigation, and publicize to your staff the methods available for individually reporting school bus drivers who have medical conditions that might affect their ability to safely operate a school bus.
6. Educate your school districts on the circumstances of the Oakland school bus crash and fire, and provide guidelines to drivers on how to present thorough

evacuation training to students; require twice-yearly documented school bus evacuation training and drills (including showing students how to open a manually operated loading door); and verify that training is available to all potential bus passengers, including students, teachers, and other school district employees who might act as chaperones or substitute school bus drivers.

**To the National Association of State Directors of Pupil Transportation Services, National Association for Pupil Transportation, and National School Transportation Association:**

7. Recommend that your members verify that students are educated on how to operate the manual release handle for front loading doors on school buses during evacuation training and drills.

**To the Riverside Community School District:**

8. During your annual school bus driver training, advise drivers on how to use the onboard 911 button in the event of an emergency.

**To Blue Bird Corporation, Collins Industries, Inc., IC Bus, Starcraft Bus, Thomas Built Buses, Inc., Trans Tech, and Van-Con, Inc.:**

9. As standard equipment on all newly manufactured school buses, install fire suppression systems that at a minimum address engine fires.
10. Ensure that, for any opening or penetration of the engine firewall, no hazardous quantity of gas or flame can pass through the firewall from the engine compartment to the passenger compartment in newly manufactured school buses.

**Previously Issued Recommendations**

**Reiterated Recommendation**

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

1. Revise Federal Motor Vehicle Safety Standard 302 to adopt the more rigorous performance standards for interior flammability and smoke emissions characteristics already in use throughout the US Department of Transportation for commercial aviation and rail passenger transportation. (H-15-12)

## **Classified Recommendation**

**To the National Association of State Directors of Pupil Transportation Services, National Association for Pupil Transportation, National School Transportation Association, American School Bus Council, and Maryland School Bus Contractors Association:**

1. Inform your members of the circumstances of the Baltimore school bus crash and lessons learned from the crash investigation to help raise awareness of the avenues available to report school bus drivers with medical conditions that may make it unsafe for them to operate a school bus. (H-18-16)

For the National Association of State Directors of Pupil Transportation Services, the National Association for Pupil Transportation, and the National School Transportation Association, Safety Recommendation H-18-16 is classified *Closed—Acceptable Action*.