

# NATIONAL TRANSPORTATION SAFETY BOARD

## Vehicle Collision with Student Pedestrians Crossing High-Speed Roadway to Board School Bus Rochester, Indiana October 30, 2018 HWY19MH003

### Executive Summary

About 7:12 a.m., on Tuesday, October 30, 2018, a 2015 Thomas Built school bus, operated by Tippecanoe Valley School Corporation, was traveling north in the 4600 block of State Route 25 (SR-25) in Rochester, Fulton County, Indiana, on its morning route. At this location, SR-25 is a two-lane highway with a posted speed limit of 55 mph. The school bus stopped at its designated location to pick up students, and the driver activated the bus's red warning lights and stop arm. At this location, an agricultural field is on the east side of SR-25 and a mobile home park is on the west side; 10 students and a parent were waiting for the school bus at the mobile home park on the other side of the road from the bus's pickup stop. A Watch For School Bus warning sign is posted for southbound traffic on SR-25 about 868 feet before the mobile home park. There is no roadway lighting at this location. Conditions were dark, the sky was cloudy, and the roadway was dry.

After being signaled by a wave from the school bus driver to cross the roadway, four of the students entered the southbound roadway. A 2017 Toyota Tacoma pickup truck traveling south on SR-25 failed to stop for the school bus and struck the four children. According to the vehicle's recorded data, the pickup truck struck the student pedestrians at 41 mph. As a result of the crash, a 9-year-old female and two 6-year-old males were fatally injured. An 11-year-old male sustained serious injuries. None of the other people waiting for the bus or any occupants of the pickup truck and school bus were injured.

The investigation identified the following safety issues:

- **Deficiencies in establishing safe school bus routes and stop locations.** The school bus route for the bus involved in this crash required students to cross a 55 mph roadway to board the school bus in the dark, early morning hours. A safe school bus route should avoid requiring students to cross high-speed roadways. Creating safe routes requires that those who develop the routes be adequately trained to assess route safety. Moreover, school bus routes should be evaluated periodically for hazards, and when individuals familiar with the route identify hazards, there should be a mechanism by which the dangers can be reported and tracked. Finally, when students must cross a roadway to board a bus, drivers and students must know and use consistent procedures to reduce the risk of the crossing.
- **Failure of other drivers to stop or otherwise respond safely when approaching a school bus that is stopped with its warning lights on and stop arm extended.** Although motorists are required by law to stop for a school bus that is stopped with its warning lights flashing and stop arm extended, many motorists fail to do so; they drive past the school bus and create a dangerous situation for any student who might be

crossing the roadway. Education and enforcement can be used to reduce motorists' illegal behavior.

- **Need for greater use of technologies to prevent collisions with, and mitigate injuries of, student pedestrians, including vehicle-to-everything (V2X), pedestrian automatic emergency braking, and school bus safety-enhancing technologies.** Although routes that require a student to cross a roadway to board a school bus (or to return home after disembarking) should be minimized, there will continue to be some routes where students will have to cross a roadway. In such cases, technology may help to prevent crashes or mitigate any injuries sustained by students.

## Findings

1. None of the following were factors in this crash: (1) mechanical condition of the pickup truck or condition of the school bus warning light and stop arm systems; (2) school bus driver licensing; (3) pickup truck driver licensing, drug or alcohol impairment, medical condition, vision, or cell phone use; or (4) actions/behavior of the student pedestrians or the adult pedestrian.
2. There is insufficient information to determine whether the school bus and pickup truck drivers were fatigued in the period leading up to the crash.
3. The emergency response to the crash was timely and effective.
4. For reasons that cannot be determined from the available evidence, the pickup truck driver did not respond to the activated warning lights and stop arm of the school bus, and she did not attempt to stop her vehicle until she saw the students in the roadway.
5. Requiring students to cross a roadway, regardless of the number of lanes, presents a risk of pedestrian death or injury because motorists do not always stop, as required, for school buses, even when a bus is at a bus stop with its lights flashing and stop arm extended.
6. Periodically evaluating school bus routes and stops for hazards can reduce the safety risks to student pedestrians.
7. The existing Indiana Department of Education training for school transportation directors does not contain sufficient information on assessing the safety of school bus routes or identifying hazards at school bus stops.
8. The routing hazards evident in the recent Hartsfield, Georgia, and Baldwyn, Mississippi, crashes suggest that inadequate school bus routing may be a widespread problem.
9. The Tippecanoe Valley School Corporation's inadequate safety assessment of school bus routes resulted in bus stops that required students to cross a high-speed roadway, placing them at risk.

10. Creating a mechanism by which school bus drivers and parents (or caregivers) of student riders could report safety concerns about bus operations would provide an additional source of information that could be used to improve the safety of school bus routes and stops.
11. The Tippecanoe Valley School Corporation's policy at the time of the crash, which required school bus drivers to determine subjectively when surrounding traffic was "controlled," left its bus drivers with insufficient information to make a safe determination about when to signal students to cross a roadway to board a school bus, placing students at risk.
12. In circumstances when a student roadway crossing cannot be avoided, the school bus driver must be knowledgeable of, and consistent when making, crossing and warning signals, and students must be aware of, and understand, the crossing and warning signals the driver makes.
13. Although it is illegal in all 50 states, National Association of State Directors of Pupil Transportation Services data show that the passing of stopped school buses by other vehicles remains a pervasive and continuing safety issue in the United States.
14. Education materials informing the driving public of the illegality and dangers of passing a school bus that is stopped to load or unload passengers are widely available from a variety of sources.
15. Evidence suggests that coupling enhanced enforcement of no-passing laws with efforts to educate motorists about the dangers of passing a stopped school bus may reduce the incidence of illegal passings.
16. The use of stop arm cameras could deter drivers from illegally passing stopped school buses.
17. It remains a safety priority that school buses be included in performance standards for connected vehicle technologies.
18. The Federal Communications Commission's proposed rulemaking to reduce Intelligent Transportation System operations to the upper 30 megahertz of the currently assigned bandwidth while opening the remaining 45 megahertz to unlicensed devices would be detrimental to safety and set back advancements in transportation safety.
19. Because school buses and the children they carry are an integral part of the transportation system, it is imperative to transportation safety that the developers and manufacturers of advanced technologies create systems in which automated and connected vehicles respond appropriately to school buses.

20. Although there are limitations to the current pedestrian automatic emergency braking systems, these safety technologies can help the driver and prevent or lessen the severity of crashes involving pedestrians.
21. Because funding for school bus equipment is limited, to make the best use of their resources, school systems need more information on which technologies are most effective in reducing illegal school bus passings and protecting students from the risk of injury.

## **Probable Cause**

The National Transportation Safety Board determines that the probable cause of the Rochester, Indiana, crash was the pickup truck driver's failure to stop for the school bus for unknown reasons, despite its clearly visible warning lights and stop arm, as well as a roadway warning sign indicating an upcoming school bus stop. Contributing to the cause of the crash was the Tippecanoe Valley School Corporation's (1) inadequate safety assessment of school bus routes, resulting in the prevalence of bus stops that required student pedestrians to cross a 55 mph roadway to board a bus, increasing the risk of injury during a collision, and (2) failure to establish a clear policy regarding surrounding traffic for school bus drivers to follow in determining when it was safe to signal students to cross a roadway to board a school bus.

## **Recommendations**

### **New Recommendations**

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

1. When evaluating safety self-assessment reports from entities testing automated driving systems on public roads, evaluate how effectively the entities include school bus operations in their plans.
2. Evaluate the effectiveness of technologies designed to reduce the incidence of illegal school bus passings, and publish and disseminate the evaluation results.

**To the states of Alaska, Arizona, California, Colorado, Delaware, Florida, Hawaii, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, Oregon, South Dakota, Texas, Vermont, and Wisconsin; the commonwealths of Kentucky and Massachusetts; and the District of Columbia:**

3. Enact legislation to permit stop arm cameras on school buses to capture images, and allow citations to be issued for illegal school bus passings based on the camera-obtained information.

**To the Indiana Department of Education:**

4. Supplement your training program for school transportation directors with a module on how to assess the safety and risks of school bus routes and stops, according to best industry practices.
5. Require local school transportation directors and others involved in evaluating school bus routes and stops in Indiana to complete the training module on the safety and risks of routes and stops recommended in Safety Recommendation [4].

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

6. Inform your members of the circumstances of the Rochester, Indiana; Baldwyn, Mississippi; and Hartsfield, Georgia, crashes, and urge them to minimize the use of school bus stops that require students to cross a roadway (especially a high-speed roadway) and to, at least annually, and also whenever a route hazard is identified, evaluate the safety of their school bus routes and stops.
7. Remind your members to ensure that school transportation directors and others involved in evaluating school bus routes and stops complete training on how to assess the safety of school bus routes and stops, according to best industry practices.
8. Advise your members to train their school bus drivers and students on crossing procedures, including the crossing hand signal and the danger signal, which are to be used when a student roadway crossing cannot be avoided.
9. Urge your members to continue to coordinate with local law enforcement agencies to conduct educational and enforcement activities aimed at reducing illegal school bus passings.

**To the International Association of Chiefs of Police, National Sheriffs' Association, and National Association of School Resource Officers:**

10. Inform your members of the fatal Rochester, Indiana; Baldwyn, Mississippi; and Hartsfield, Georgia, crashes, and encourage them to continue to work with local school districts to conduct educational and enforcement activities to reduce illegal school bus passings.

**To the Tippecanoe Valley School Corporation:**

11. Implement a process to track school bus driver and parent (or caregiver) complaints regarding the safety of school bus routes and stops, as well as any other safety concerns about bus operations, from initial submission of an issue to its resolution.

12. Train your school bus drivers and students on crossing procedures, including the crossing hand signal and the danger signal, which are to be used when a student roadway crossing cannot be avoided.

## **Previously Issued Recommendations Reiterated in This Report**

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

Develop minimum performance standards for connected vehicle technology for all highway vehicles. (H-13-30)

Once minimum performance standards for connected vehicle technology are developed, require this technology to be installed on all newly manufactured highway vehicles. (H-13-31)

Incorporate pedestrian safety systems, including pedestrian collision avoidance systems and other more-passive safety systems, into the New Car Assessment Program. (H-18-43)