



Testimony of

National Transportation Safety Board

Before the

**Senate Judicial Proceedings Committee
The Maryland General Assembly**

— On —

Senate Bill 724, Motor Vehicles - School Buses - Seat Belts

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Chair Smith, Vice Chair Waldstreicher and members of the committee, the National Transportation Safety Board (NTSB) appreciates the opportunity to provide testimony regarding SB 724 – legislation that would require occupant restraining devices to be installed in every school bus purchased after October 1, 2024.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

School bus travel is one of the safest forms of transportation in the United States. Children are safer traveling in school buses than in any other vehicle. School buses are designed with a passive form of occupant protection, termed “compartmentalization,” which only requires the passenger to sit properly in the seat facing forward and functions by forming a compartment around the bus occupant. Compartmentalization is designed to contain passengers within their seating compartments during frontal and rear impact collisions. A key aspect of this occupant protection system is that passengers remain within the compartment prior to and during an impact, so that they benefit from the energy-absorbing seat design. However, we have completed numerous investigations that identified occupant protection as a safety issue in school bus transportation, particularly in crashes that include side-impact collisions, rollovers in which compartmentalization is incomplete and provides insufficient protection for occupants, or in circumstances with pre-crash bus maneuvers that move occupants out of the protective seating compartment before the crash occurs. Therefore, we have recommended enhancements to school bus occupant protection systems to address these scenarios.

On October 27, 2020, a freightliner truck collided with a school bus in Decatur, Tennessee, killing the bus driver and a 7-year-old passenger and injuring multiple passengers. We found that several of the school bus passengers were not seated properly in their seats, which increased their risk of injury. Lap/shoulder belts would have further mitigated the forward inertial movement of the unbelted passengers on the school bus, keeping them within the protecting seating compartment and reducing their risk of injury especially for those passengers near the impact area.

On November 21, 2016, six students died, and more than 20 others were injured in Chattanooga, Tennessee, when a Hamilton County Department of Education (HCDE) school bus, operated by Durham School Services (Durham), struck a utility pole, rolled onto its right side, and collided with a tree. The bus was carrying 37 students and traveling 52 mph in a 25-mph zone at the time of the crash. The bus driver was transporting the students from the school to their drop-off locations when he answered a cell phone call. The cell phone call was still active when he lost

control of the bus and departed the roadway. We concluded that the Chattanooga school bus driver's speeding, combined with his cell phone use while driving, led to the crash. The Chattanooga school bus passengers were at risk due to the precrash vehicle motions that threw them from their seating compartments prior to the bus striking the utility pole. This rendered compartmentalization ineffective during the rollover sequence. Therefore, we recommended that each state, including Maryland, require that lap/shoulder belts be installed in all new large school buses to provide the best protection for all their occupants.

In February 2012, a school bus transporting students to Chesterfield Elementary School in, Chesterfield, New Jersey, was struck at an intersection by a roll-off truck, resulting in 1 bus passenger fatality, 5 serious injuries, and 11 minor injuries. The fatally and severely injured passengers were seated in the back half of the school bus, in the area of higher impact forces and accelerations. Some students on the school bus wore their lap belts improperly or not at all. As a result of our investigation, we concluded that, in severe side-impact crashes like the Chesterfield crash, properly worn lap/shoulder belts reduce injuries related to upper body flailing that are commonly seen with lap-only belts and, therefore, provide the best protection for school bus passengers. Further, better student, parent, and school district education and training may increase the use and proper fit of passenger seat belts in school buses. Thus, we recommended that school districts provide improved information to parents and students regarding the importance of properly using seat belts on school buses.

We also completed an investigation of a collision involving a school bus and a pickup truck in Helena, Montana where we concluded that the passenger lap/shoulder belts mitigated injuries in this side impact and rollover crash. In November of 2012, a 12-passenger school bus was struck by a Dodge Ram 1500 pickup truck after entering an intersection near Helena. The bus was occupied by the driver, an adult aide, and two student passengers. The pickup truck was occupied by the driver and one passenger. Following the collision, the school bus departed the intersection to the southeast, struck an electrical equipment box, and overturned 90 degrees onto its right side. The four lap/shoulder belted occupants of the bus were treated for minor injuries. We concluded that the passenger lap/shoulder belts helped keep the school bus occupants within their seating compartments during the side impact crash and that the passenger lap/shoulder belts limited occupant-to-occupant contact and associated injuries during the rollover event. None of the bus occupants suffered concussions or other injuries that impeded their ability to evacuate. Such injuries are not uncommon in vehicle rollovers. The absence of head or extremity injuries indicated that the lap/shoulder belts were effective in protecting the bus passengers.

Finally, our investigation of a 2014 single vehicle school bus crash in Anaheim, California demonstrated that the proper use of lap/shoulder belts on the school bus reduced passenger injuries. A 24-year-old male school bus driver was in the process of completing his afternoon route driving middle school-aged children home from school when he lost consciousness as a result of a medical condition. The unconscious driver lost control of the school bus on a downhill graded and leftward curving roadway in a 35-mile per hour zone. The school bus departed the roadway to the right at a video estimated speed of 43-miles per hour. The school bus then mounted the curb, where it struck and dislodged a concrete light post. The bus continued up the

embankment where the front of the bus struck and uprooted a tree. The bus also scraped along a large tree on the left side of the bus from the front axle backward to the rear axle. The bus came to rest at an angle on the embankment, leaning onto the large tree. The tree caused extensive intrusion into the school bus especially in the region near the left side emergency exit door. Importantly, two students seated in the area of maximum crush were wearing their seatbelts at the time of the crash. We found the severity of passenger injuries in the area of maximum intrusion was reduced by the proper use of the available lap/shoulder belts by the student passengers seated in this area.

Although compartmentalization makes school buses extremely safe, passengers without lap/shoulder belts remain vulnerable to either ejection or injury within the school bus (for example, from being thrown into an intrusion area). Therefore, to protect large school bus passengers, we recommend that Maryland amend its statute to require passenger lap/shoulder belts for all passenger seating positions in new large school buses in accordance with Federal Motor Vehicle Safety Standard 222.