Written Statement of

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— On —

Study of Bus Passenger Safety—

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Bus Passenger Safety and Associated NTSB Most Wanted List Safety Issues

In 1967, Congress established the NTSB as an independent agency within the United States Department of Transportation (USDOT) with a clearly defined mission to promote a higher level of safety in the transportation system. In 1974, Congress reestablished the NTSB as a separate entity outside of the USDOT, reasoning that "no federal agency can properly perform such (investigatory) functions unless it is totally separate and independent from any other…agency of the United States."[1] Because the USDOT has broad operational and regulatory responsibilities that affect the safety, adequacy, and efficiency of the transportation system, and transportation accidents may suggest deficiencies in that system, the NTSB's independence was deemed necessary for proper oversight.

The NTSB is charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—highway, rail, marine, and pipeline. We determine the probable cause of the accidents we investigate, and we issue recommendations to federal, state, and local agencies, and other entities, aimed at improving safety, preventing future accidents and injuries, and saving lives. The NTSB is not a regulatory agency in the conventional sense – it does not promulgate operating standards and does not certificate organizations and individuals. The goal of our work is to foster safety improvements, through formal and informal safety recommendations, for the traveling public.

On call 24 hours a day, 365 days a year, our investigators travel throughout the country and to every corner of the world in response to transportation disasters. In addition, we conduct special transportation safety studies and coordinate the resources of the federal government and other organizations to assist victims and their family members who have been impacted by major transportation disasters. Since our inception, we have investigated more than 146,000 aviation accidents and thousands of surface transportation accidents. We have issued more than 14,650 safety recommendations to more than 2,400 recipients in all transportation modes, over 82 percent of which have been implemented.

In the case of highway accidents, current law grants the NTSB jurisdiction to investigate those "highway accident[s], including a railroad grade crossing accident, the Board selects in cooperation with a State."[2] The NTSB has a distinguished record of contributing to highway safety for decades. For example, as a result of the NTSB's investigative work and safety recommendations, automobile airbags for all citizens are safer, child restraint fitting stations are available nationwide, and graduated driver licensing programs for teenagers have been implemented by many states. Additional examples of safety improvements inspired by or resulting from investigations or recommendations of the NTSB include improvements in the design and construction of school buses, highway barrier improvements, and center high-mounted rear brake lights on automobiles. Although there is no way to quantify the accidents that did not happen or the lives that were not lost because of the efforts of the NTSB, the tangible safety improvements that can be directly associated with the work of the NTSB have saved countless lives and avoided millions and perhaps billions of dollars in injuries and property damage.

[1] Independent Safety Board Act of 1974 § 302, Pub. L. 93-633, 88 Stat. 2166-2173 (1975).

[2] 49 U.S.C. § 1131(b)

Bus Passenger Safety and Associated NTSB Most Wanted List Safety Issues

Our goal is zero deaths and injuries on our nation's roadways; to eliminate the more than 37,000 people killed in crashes on US highways in 2017.[3]

On February 4, 2019, we announced our Most Wanted List of Transportation Safety Improvements (MWL) for 2019–2020.[4] First issued in 1990, the MWL serves as the agency's primary advocacy tool to help save lives, prevent injuries, and reduce property damage resulting from transportation accidents. The NTSB created the program to increase industry, Congressional, and public awareness of the transportation safety issues identified in our accident investigations and safety studies. Safety issues highlighted on the MWL receive increased emphasis and become the primary focus of our advocacy activities.

The issues selected for the MWL are chosen from our safety recommendations and emerging areas. Selections are based on the magnitude of risk, potential safety benefits, timeliness, and probability of advocacy efforts to bring about change. Issues selected have been thoroughly validated by our investigations. They are issues we identify as having received insufficient or inadequate action. They are issues that could create a high safety risk if not addressed.

Our 2019–2020 list includes seven areas that affect highway safety:

- Implement a Comprehensive Strategy to Reduce Speeding-Related Crashes
- End Alcohol and Other Drug Impairment
- Eliminate Distractions
- Strengthen Occupant Protection
- Increase Implementation of Collision Avoidance Systems in All New Highway Vehicles
- Reduce Fatigue-Related Accidents
- Require Medical Fitness – Screen for and Treat Obstructive Sleep Apnea

My written statement will focus on strengthening occupant protection and increasing implementation of collision avoidance technologies.

Strengthen Occupant Protection

We have investigated many crashes in which improved occupant protection systems, such as seat belts, child restraints, and other vehicle design features, could have reduced injuries and saved lives. Recent investigations have highlighted the importance of proper use of the safety equipment, effective design, and readily accessible and identifiable evacuation routes on larger passenger vehicles, such as limousines, school buses, motor coaches, and other commercial vehicles.

Seat belts are the best defense against motor vehicle injuries and fatalities because they protect vehicle occupants from the extreme forces experienced during crashes. Unbelted vehicle

[3] National Highway Traffic Safety Administration, *2017 Motor Vehicle Crashes: Overview* (Washington, DC: NHTSA, 2018).

[4] National Transportation Safety Board, *2019-2020 Most Wanted List* (Washington, DC: NTSB, 2019).

occupants frequently injure other occupants, and unbelted drivers are less likely than belted drivers to be able to control their vehicles. In addition, seat belts prevent occupant ejections. In 2016, only 1 percent of vehicle occupants using seat belts were ejected, while 29 percent of unbelted vehicle occupants were ejected. Among those occupants completely ejected from their passenger vehicles, 81 percent were killed. NHTSA estimates that seat belts saved the lives of nearly 15,000 motor vehicle occupants age 5 and older in 2016, nationwide. Further, had all passenger vehicle occupants age 5 and older used seat belts in 2016 an additional 2,456 lives could have been saved. From 1975 through 2015, seat belts saved more than 344,000 lives nationwide.

Since 1995, we have recommended that states enact legislation providing for the primary enforcement of seat belt laws, which would allow law enforcement officers to stop a vehicle solely because occupants are not wearing seat belts. Currently, 34 states and the District of Columbia authorize primary enforcement of their seat belt laws, but only 29 states apply the law to all passenger seating positions. In 2015, we recommended that states enact legislation for primary enforcement of a mandatory seat belt use law for all vehicle seating positions equipped with a passenger restraint system.[5] This recommendation covers all motor vehicles, including buses. Primary enforcement of mandatory seat belt use laws remains the best way to raise and maintain high seat belt use rates. States that have enacted primary enforcement seat belt laws have historically experienced increases in seat belt use rates between 5 and 18 percentage points. The increased use is based on the realization by drivers that they may be stopped for violating the seat belt law.[6]

We have a long history of investigating school bus crashes. We have found compartmentalization to be effective in frontal collisions, but have also identified the limitations of passenger seats with no belts or lap belt only restraints. Modern school bus seat technology has overcome previous capacity issues, and the installation and proper use of passenger seat belts, particularly lap/shoulder belts, has made school buses safer in severe side impacts and rollovers. On November 21, 2016, six students died, and more than 20 others were injured in Chattanooga, Tennessee, when a Hamilton County Department of Education school bus struck a utility pole, rolled onto its right side, and collided with a tree. Contributing to the severity of the crash was the lack of passenger lap/shoulder belts on the bus.[7] In a special investigation report we developed following this crash, we recommended that jurisdictions which do not yet require passenger belts in large school buses enact legislation to require that all new large school buses be equipped with passenger lap/shoulder belts for all passenger seating positions.[8] The NTSB also developed an educational video addressing occupant protection for school bus occupants.[9]

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[5] National Transportation Safety Board, Safety Recommendation H-15-042.

[6] Centers for Disease Control and Prevention, *Primary Enforcement of Seat Belt Laws*, https://www.cdc.gov/motorvehiclesafety/calculator/factsheet/seatbelt.html

[7] National Transportation Safety Board, *Selective Issues in School Bus Transportation Safety: Crashes in Baltimore, Maryland, and Chattanooga, Tennessee*, Rpt. No. SIR-18/02 (Washington, DC: NTSB, 2018).

[8] National Transportation Safety Board, Safety Recommendations H-18-009 and H-18-010.

[9] National Transportation Safety Board, School Bus Safety, https://www.ntsb.gov/safety/Pages/schoolbuses.aspx.

We have also made recommendations to NHTSA regarding front, side, and rear underride protections for tractor-trailer and single unit trucks to reduce underride and injuries to passenger vehicle occupants. Specifically, as a result of our safety investigations, we have recommended that NHTSA establish performance standards for front, side, and underride protection systems for single-unit trucks with gross vehicle weight ratings over 10,000 pounds, and to require such systems on all such newly manufactured trucks.[10] Each of these recommendations are currently classified "Open—Unacceptable Response." We have also recommended that NHTSA require side and rear underride systems for newly manufactured trailers with gross vehicle weight ratings over 10,000 pounds.[11] Each of these recommendations is currently classified "Open—Acceptable Response."

Increase Implementation of Collision Avoidance Technologies

More than 90 percent of crashes on United States roadways can be attributed to driver error.[12] For more than two decades, we have been advocating implementation of various technologies to help reduce driver error. Vehicle-based collision avoidance technologies, such as forward collision warning (FCW) and autonomous emergency braking (AEB) systems, are important for avoiding or mitigating the impact of rear-end crashes, which represent nearly half of all two-vehicle crashes. Other driver-assist and collision avoidance technologies, such as adaptive cruise control, advance lighting, blind spot detection, and lane departure warning systems can aid drivers and help reduce the occurrence of other types of crashes. These technologies improve visibility, help maintain safe distance between vehicles, alert drivers to impending hazards and potential crashes, or automatically brake to mitigate the consequence of a crash.

In 2015, we issued a special investigation report regarding the use of forward collision avoidance systems to prevent and mitigate rear-end crashes. The report was based on the examination of current research into the effectiveness of collision avoidance systems and investigations of nine crashes—that resulted in 28 fatalities and injuries to 90 vehicle occupants—involving passenger or commercial vehicles striking the rear of another vehicle. As part of this report, we recommended that passenger and commercial vehicle manufacturers install FCW and AEB as standard equipment, and, in order to incentivize manufacturers, that NHTSA expand the New Car Assessment Program (NCAP) to include ratings for various collision avoidance technologies.[13] More recently, on the night of January 19, 2016, a motorcoach occupied by a driver and 21 passengers collided with an unmarked crash attenuator and concrete barrier on a highway in San Jose, California, during low visibility conditions. Two passengers were ejected and died, and the driver and 13 passengers were injured. Upon later testing, we determined that had the bus

[10] National Transportation Safety Board, Safety Recommendations H-10-012, H-10-013, H-13-013, H-13-014, H-13-015, and H-13-016.

[11] National Transportation Safety Board, Safety Recommendations H-14-002 and H-14-004.

[12] National Highway Traffic Safety Administration, Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey. February 2015, (DOT HS 812 115).

[13] National Transportation Safety Board, *The Use of Forward Collision Avoidance Systems to Prevent and Mitigate Rear-End Crashes*, Rpt. No. SIR-15/01 (Washington, DC: NTSB, 2015).

been equipped with a collision avoidance system, the system could have detected the crash attenuator and alerted the driver to the hazard to mitigate or prevent the crash.[14]

The special investigation report detailing "Selective Issues in School Bus Transportation Safety: Crashes in Baltimore, Maryland, and Chattanooga, Tennessee" also focused on the benefits of electronic stability control (ESC) and automatic emergency braking (AEB) in improving driver and vehicle safety. The NTSB concluded that had the vehicle instability—caused by the Chattanooga bus driver's excessive speed and steering input—occurred in a newly manufactured school bus equipped with an electronic stability control system, the technology could have assisted the driver in maintaining vehicle control and mitigated the severity of the crash by reducing the speed of the vehicle. Further, NTSB crash investigations and industry research have shown that collision avoidance systems with AEB and ESC are an effective countermeasure to prevent or mitigate the severity of crashes and to reduce the frequency of rear-end or loss-of-control crashes. As a result, the NTSB recommended that NHTSA require all new school buses to be equipped with collision avoidance systems and automatic emergency braking technologies. (H-18-8). The NTSB also reiterated two safety recommendations to NHTSA to develop stability control system performance standards for all commercial motor vehicles and buses with a gross vehicle weight rating greater than 10,000 pounds, regardless of whether the vehicles are equipped with a hydraulic or a pneumatic brake system (H-11-7) and once the performance standards from Safety Recommendation H-11-7 have been developed, require the installation of stability control systems on all newly manufactured commercial vehicles with a gross vehicle weight rating greater than 10,000 pounds. (H-11-8). Safety recommendations H-11-7 and H-11-8 are currently classified "Open—Unacceptable Response." Safety recommendations H-18-8 is currently classified "Open—Initial Response Received."

Conclusion

Thank you for the opportunity to submit written comments. While my comments address many bus safety concerns, these are only some of the safety improvements we have identified as needed to prevent crashes, reduce injuries, and save lives.

[14] National Transportation Safety Board, *Motorcoach Collision With Crash Attenuator in Gore Area, US Highway 101*, Rpt. No. HAR-17/01 (Washington, DC: NTSB, 2017).