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Response to emailed questions:

1. What work has been done on the resiliency of the coach section of buses in the event of a crash?
 - a. Is the US considering standards for structural integrity?
 - b. Are crash tests done on modern transit, school and highway coach buses? If so, how are they performing
 - c. Answers: The National Highway Traffic Safety Administration (NHTSA) conducted a full-scale frontal crash test of a modern motorcoach, as well as sled tests and static tests. A report on the work was published in May 2010 (DOT HS 811 335). In addition, NHTSA performed several rollover tests of motorcoaches to assess the roof strength in support of rulemaking. (Docket No. NHTSA–2014–0085 Federal Motor Vehicle Safety Standards; Bus Rollover Structural Integrity, Motorcoach Safety Plan) School bus crash tests have been performed by various organizations including NHTSA, IMMI, and Transport Canada to assess the performance in frontal, side, and rollover crash scenarios. Often, these tests evaluate the occupants in various restraint conditions including unbelted, lap belted and lap/shoulder belted. The NTSB Most Wanted List fact sheet on [Occupant Protection](#) highlights the recent NTSB investigations addressing these issues, as well as associated recommendations for lap/shoulder belts on buses and proper use of available belts for all occupants. The Federal Transit Administration also sponsored research to evaluate transit buses and published a report on the topic in 2012 (Crashworthiness Evaluation of Mass Transit Buses, FTA Report No. 0021). The NTSB also believes that medium-size (shuttle) buses should be included in requirements addressing occupant protection, roof strength, and window retention.
2. There is an apparent trend for buses, including school buses, to be much lighter by design to improve fuel efficiency. While this may be appropriate for vehicles driven at urban speeds, our concern is when these vehicles are used to transport school-aged children on field trips, including at highway speeds. Is your board considering different standards for buses depending on their operating conditions?
 - a. Answer: NTSB investigations cover many different crash environments, including bus crashes at highway speeds. Our recommendations to ensure sufficient survival space is maintained and that occupants are properly restrained to keep them within the survival space apply for all operating environments.
3. With increasing public calls for safety belts on buses, including school buses, what is your Board's views on mitigating the safety risk the belts present, especially to smaller passengers?
 - a. Answer: The NTSB continues to follow school bus crashes with passenger equipped lap/shoulder belt buses and has not seen specific safety risks to smaller passengers in lap/shoulder belts.
4. Is your TSB considering integrated booster seats on safety belt equipped buses, similar to those available on passenger vehicles (especially minivans) since the 1990's?
 - a. Some manufacturers are installing this type of seat for special needs students in school buses. The NTSB has not investigated a crash with this type of restraint in use in a school bus.

5. Are you experimenting with 'wings' on seat backs to limit side-to-side head movements in the event of a side impact or roll-over?
 - a. We have not seen this design of seat back in our bus investigations to date.
6. Are airbags being considered in buses?
 - a. Answer: I am not aware of airbags for passengers aft of the front seats in buses.
7. Are Canadian and American school bus and coach construction standards comparable? What are the major differences?
 - a. Many of the vehicles are manufactured by the same companies. This question may be better answered by the manufacturers for school buses, transit buses, motorcoaches, and medium-size (shuttle) buses.
8. What were the reasons for deciding to install seatbelts in coaches?
 - a. The NTSB has a long history of investigating motorcoach crashes and issuing recommendations to increase the safety of motorcoach passengers. In 2013, NHTSA responded to our recommendations and issued a final rule requiring passenger lap/shoulder belts in motorcoaches and other large buses. The details of this rulemaking was published in the Federal Register on November 25, 2013 and supporting information is available in the NHTSA docket (Docket No. NHTSA-2013-0121).
9. Do you believe this regulation should be extended to school buses? What are the challenges inherent in school buses that make this regulation difficult to implement?
 - a. In 2018, the NTSB published a report titled: "[Special Investigation Report - Selective Issues in School Bus Transportation Safety: Crashes in Baltimore, Maryland, and Chattanooga, Tennessee.](#)" A summary of NTSB previous recommendations and the newest recommendation for States to require passenger lap/shoulder belts in large school buses is included in that report. One main challenge is that school buses are already the safest form of transportation for children to and from school and school-related activities, which makes justifying the benefit of passenger lap/shoulder belts more challenging for regulatory approval. The NTSB continues to evaluate other benefits of passenger lap/shoulder belts beyond reduced injuries and fatalities.