



# Indirect Effects of School Bus Seat Belt Installation

## Background

Traveling by school bus is the safest mode for transporting pupils to school (NHTSA, 2020). Donoughe and Katz (2015) analyzed school bus crashes over a decade and found that of the fatal school bus-related crash injuries, 6.2% were school bus occupants. While compartmentalization inside the bus and other safety features outside the bus (such as the color of school buses) have contributed to the strong safety record of school buses, adding seat belts may further reduce the number of injuries and fatalities.

While the direct benefit of adding seat belts to school buses is to enhance the protection and safety already provided by compartmentalization (Kuppa, 2015), there may be indirect benefits as well, such as improved student behavior and reduced driver distraction. To explore these types of indirect benefits, data were collected through a variety of methods and sources on how seat belts may indirectly affect behavior and safety on school buses. This report synthesizes the results of a literature review and a program scan, as well as a survey of bus drivers and interviews with school district officials obtained from a concurrent NHTSA project.

## Method

### Literature Review

The literature review focused on identifying indirect safety effects of seat belts on school buses; however, because of the likelihood that few studies have solely examined these indirect effects, the literature review also concentrated on broader topics such as seat belts on school buses, in general, and the effects of visual and auditory distraction on drivers using a more restricted search for general topics, i.e., topics not necessarily or directly related to school buses or seat belt use. The primary and general topics are shown in Table 1.

### Interviews/Surveys

Stakeholder interviews were used to gather information regarding the perceived benefits and considerations of seat belts on school buses, and specifically how they relate to indirect effects of seat belts. Professional contacts and associations were used to identify programs with experience and perspectives that would be useful to the project. Emphasis was placed on gaining participation from States with and without seat belt installation and/or required use policies at the State legislative level. To ensure a comprehensive understanding of different barriers and concerns regarding seat belts, districts that

had already implemented seat belts, as well as some districts that had not implemented seat belts, were included.

**Table 1. Literature Review Topics**

Literature Review Topic Areas
<b>Primary Literature Review Topics</b>
General Indirect Effects of Seat Belts on School Buses
Student Behavior Management
Bus Driver Stress and Distraction
Bus Driver Satisfaction and Retention
Loading and Unloading Times of Buses
Decreased Space Inside Buses
Effects on Route Times
Transfer of Effects to Passenger Vehicles
<b>General/Support Topics</b>
Changes In/Effects of Sound Level on Buses
Distracted Driving
Distraction in the Car With Children
Children Arriving to School Ready to Learn

Prior to the interviews, a brief, 15-minute, online survey was shared with districts for bus drivers to complete. A total of 23 initial interviewees mentioned indirect effects of seat belts, of which 5 mentioned effects not covered in the bus driver survey during their interview. These 5 interviewees were selected for followup discussions.

## Results

One of the first topics examined was seat belt use. A common finding from the literature review, stakeholder discussions, and bus driver survey was that younger students are more likely to use their seat belts than are older students. For example, both school transportation officials and bus drivers noted that elementary students utilized the seat belts more consistently than high school students, regardless of the presence of a seat belt use policy.

The effect of seat belt use on behavior was influenced by a variety of factors, but the majority of the findings across the collection modes indicated that increased seat belt use was associated with improved student behavior, including fewer discipline referrals and more students staying in their seats. A study using video and interviews found that seat belts were more likely to have a positive effect on on-board behaviors

when drivers enforced a seat belt policy and/or used the seat belts as a behavioral management tool (e.g., compliant students could choose where to sit; from a 2018 internal report for the North Carolina Department of Public Instruction). In the current survey, bus drivers reported that the behavior of students either improved (60%) or remained the same (35%) after they began driving a bus with seat belts, with very few (5%) reporting that student behavior became worse. Discussions with stakeholders also showed, almost unanimously, that drivers experience improvements in behavior on buses equipped with seat belts.

Reduced driver distraction was associated with seat belt use. For instance, the literature review found that school bus drivers face a unique driving distraction experience wherein student misbehavior increases the incidence of safety shortcuts and the level of safety violations (Zohar & Lee, 2016). For the current bus driver survey, bus driver distraction and stress levels were more likely to decrease after driving buses with seat belts and driver distraction decreased with an increase in reported seat belt use. Several interviewees relayed that some drivers initially felt that seat belt required use policies were burdensome, but drivers became strong proponents once they saw the benefits of seat belt use on their own buses.

## Conclusions and Discussion

As evidenced by the literature review, some research studies investigated the impacts of school bus seat belts on capacity, as well as use rates, but research investigating indirect effects on safety have been minimal. Research areas such as distracted driving and children as a source of distraction, provide some additional insight on potential indirect safety effects. While self-reported and based on a small sample size, the project's effort identifying and analyzing stakeholder responses provides additional information on potential indirect effects of improved student behavior, including a reduction in bus driver stress and distraction and increased school bus driver satisfaction and retention. In addition, the impacts on route times, loading times, and capacity were also discussed.

Although there are some limitations to the current investigation, this study also generated lessons learned that may provide useful direction for future more comprehensive studies.

To help ensure a successful seat belt program, it is important to not only train bus drivers in the use and enforcement of seat belts, but to keep them motivated to find the best ways to encourage seat belt use on their buses. Assigning specific responsibilities to bus drivers may not be enough to influence seat belt use, as drivers' motivation, encouragement, and enforcement efforts are likely the strongest determinants of seat belt use. While this study offers an overview of the indirect benefits of seat belts based on a literature review, program scan, and stakeholder experience, a more detailed study focusing on the indirect benefits experienced by a sample of school jurisdictions would better quantify the potential outcomes of school bus seat belt use.

## References

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