Why your child's school bus has no seat belts
By M. Alex Johnson Reporter msnbc.com
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Ashley Brown, 16, and Alicia Bonura, 18, both of Beaumont, Texas, died March 29, 2006. They were on a bus carrying their West Brook High School soccer team when it overturned near Devers, Texas, on its way to a playoff game in Humble.

Steve Forman's daughter Allison was among 21 other team members who were injured. "Once she regained enough consciousness, to have to tell her that her two friends were dead, I think that's the hardest thing I've ever had to do in my life," Forman said.

Allison, who was 17 at the time, was ejected through the window, and she underwent four operations to reconstruct her arm, which was pinned beneath the bus for an hour.

Steve Forman and Brad Brown, Ashley's father, are convinced that things would have been very different if only the bus had been equipped with seat belts.

1. An msnbc.com-NBC News special report

By Alex Johnson of msnbc.com. The following NBC stations contributed to this report: KPRC of Houston; KXAN of Austin, Texas; WDTN of Dayton, Ohio; and WJHG of Panama City, Fla.

On Sept. 1, more than four years after the West Brook bus crash, a Texas law went into effect requiring some school buses to have seat belts. But "Ashley's and Alicia's Law" — the result of lobbying by Brown, Forman and other Texas parents — is now in limbo because of a Texas Education Agency contention that it isn't really mandatory because the Legislature cut the money to pay for it by two-thirds.

Kids in Texas aren't the exception. Most school buses in the United States don't have seat belts or similar restraints to protect children in an accident. Federal law requires them in buses under 10,000 pounds, but that's only a small proportion of the school buses in use — picture those tiny 6- to 12-seater buses you sometimes see, which are usually fully equipped for transporting disabled and other special-needs pupils. They're treated like cars, light trucks and passenger vehicles because of their similar low weight and center of gravity.

But larger buses — like the standard long yellow school bus that makes up about 80 percent of the nation's fleet and the school-chartered coach carrying the West Brook soccer team — weigh in much heavier, and their passengers sit much higher, making them safer in collisions. For those, federal education and transportation agencies leave the decision up to the states. And so far, only six require seat belts to be installed. (See box below. This paragraph was updated to reflect that school-chartered coaches fall under the same rules.)
If cars have seat belts, why aren't they generally required in school buses? Because modern school buses are already remarkably safe, and because seat belts don't work the same way in buses as they do in cars, research shows.

Numerous federal and academic studies have concluded that school buses are the safest form of ground transportation of all, in fact. The National Safety Council says they're about 40 times safer than the family car.

1. School bus seat-belt laws

   • U.S.: The federal government requires seat belts in buses weighing less than 10,000 pounds but not in larger buses. States have the discretion to use them or no on larger buses, which is most of them. If they do use belts or other restraint systems, they must meet federal standards. Federal Regulation: 49 CFR 571.222 (PDF)
   California: California requires three-point seat belts on newer buses and requires passengers to use them. California Department of Transportation
   Florida: Florida requires seat belts or another restraint system that meets federal standards on newer buses and requires passengers to use them. Florida Code
   • Louisiana: Since 2004, Louisiana has required that every bus "shall be equipped with occupant restraint systems." Louisiana Statute
   • New Jersey: New Jersey requires school buses to have "seat belts of the lap belt type for each seating position on the bus or other child restraint systems that are in conformity with applicable federal standards." New Jersey Statute
   • New York: New York requires school buses to have seat belts and increased seat back padding. New York Statute
   • Texas: Beginning Sept. 1, Texas requires each new bus to have three-point seat belts, contingent on the Legislature's appropriating money to pay for them. State budget cuts have left that funding in limbo, and the state school board has interpreted the regulation to be voluntary as a result. Texas Education Code

Source: MSNBC research

About 440,000 public school buses carry 24 million children more than 4.3 billion miles a year, but only about six children die each year in bus accidents, according to annual statistics compiled the National Highway Traffic Safety Administration. About 800 children, by contrast, die every year walking, biking or being driven to school in cars or other passenger vehicles, said Ron Medford, the agency's deputy director.

That's because designers of modern school buses don't trust squirmy children to use seat belts properly. Instead, they use a passive system called compartmentalization. Bus seats aren't packed so closely together just to maximize capacity (although that's one reason); they're spaced tightly and covered with 4-inch-thick foam to form a protective bubble.

In a crash, "the child will go against the seat, and that will absorb most of the impact," said John Hamilton, transportation director for the Jackson County, Fla., school board. "Plus, it's a safety device so that they won't be projecting through the air."
Cost and risks of seat belts
School and transportation officials cite two other main reasons for declining to install seat belts:

• Cost. Separate studies by the NHTSA and the University of Alabama (.pdf) concluded that installing seat belts would add anywhere from $8,000 to $15,000 to the cost of a new bus while having little to no impact on safety.

Seat belts would also take up room that's now used for seats, meaning "fewer children can be accommodated on each row," according to the Alabama study. That could require school systems to increase their bus fleets by as much as 15 percent just to transport the same number of pupils, it suggested.

"The cost of installing seat belts on every bus at once is prohibitive," said the authors of the Alabama study, the October release of which was highly anticipated by school officials nationwide because it is among the first large-scale analyses of the subject.

Seat belts would have to be phased in over a decade at a minimum cost of $117 million per state. That cost could be prohibitive, "especially when the nation is dealing with an economic downturn," the study said.

• Safety. Numerous safety agencies say seat belts aren't the best choice for children, which is why nearly all states require container-like full car seats for younger kids in passenger cars.

"Lap/shoulder belts can be misused and NHTSA's testing showed that serious neck injury and perhaps abdominal injury could result when lap/shoulder belts are misused," the NHTSA warned in its study, adding that "increased capital costs, reduced seating capacities, and other unintended consequences associated with lap/shoulder belts could result in more children seeking alternative means of traveling to and from school."

"Even the smallest reduction in the number of bus riders could result in more children being killed or injured when using alternative forms of transportation," it said.

1. Most popular

Moreover, passengers have to remain seated and locked in for seat belts to work, but as any parent can tell you, children and adolescents don't sit still.

In a report this year (.pdf), the Texas Transportation Institute of Texas A&M University told the Legislature, which was considering funding for the state's new seat-belt law, that asking bus drivers to monitor compliance was unrealistic.

"The highest priority has to be a focus on the driving task," said the institute. It said that seat belts could offer some safety benefits, but only "under a limited range of conditions," and counseled that they "should not be considered an all-purpose preventative measure."

The Alabama study drew a similar conclusion, reporting that "enforcement by the driver is almost impossible" and quoting drivers' concerns that they could be held legally liable if a child was injured while not using his or her seat belt properly.

'Costs far exceed benefits'
Taking all those factors into account, many transportation safety experts conclude that seat belts aren't worth it.
"Costs far exceed benefits, and school bus seat belts appear to be less cost-effective than other types of safety treatments," the Alabama study declared. The NHTSA said its research, going back to 1987, suggests that the benefits are "insufficient to justify a federal requirement for mandatory installation of such belts" in larger buses.

"Most school bus passenger fatalities are because the passenger's seating position was in direct line with the crash forces, and seat belts would not have prevented these fatalities," Medford, deputy head of the NHTSA, told school transportation officials at a meeting in Washington in April (transcript .pdf).

Some groups, like the National Coalition for School Bus Safety, say the evidence is incomplete and unconvincing, and they unconvincing, arguing that skepticism over seat belts is driven by "an economically driven industry."

But most organizations dedicated to school transportation oppose mandatory seat belts, including the National Association for Pupil Transportation, the National School Transportation Association and the National Association of State Directors of Pupil Transportation Services.

That doesn't persuade parents like Brad Brown. He continues to push Texas officials to fund and enforce the new state law that's named after his daughter and her friend "so no other dad has to bury a 16-year-old daughter simply because proper safety measures weren't taken."

If the West Brook bus had been equipped with seat belts on that day in 2006, "I'm certain Ashley would have survived and many of the other girls would have escaped serious injury."

"Parents expect better," he said.

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School Bus Seat Belt Background

Why are there no seat belts on school buses?

History:
Thirty-five years ago in California, UCLA engineers performed a series of classic school bus crash studies, which determined that the major cause for injury in school bus accidents was the inadequacy of school bus seats. They proposed “compartmentalization” of the child occupants between high-back, well-padded and well-anchored seats capable of absorbing crash forces with large aisle side panels to contain riders. A lap belt was recommended to provide substantial additional protection.

Ten years later, in response to a Congressional mandate, NHTSA promulgated Federal Motor Vehicle Standard 222 that provided for some of the proposed features. The 222 seat was better anchored, padded and designed for energy absorbing and was 4 inches higher than seats then in use.

When Standard 222 was implemented, children who were to ride on large school buses manufactured after that date, were promised, and subsequently have relied on, being safely compartmentalized between high-back, well-padded and anchored seats for crash protection. Since that time, agencies, departments and representatives of Federal, State and Local governments, school district officials, school bus manufacturers, pupil transportation directors, and the operators of school buses have confidently and persistently assured parents and children that compartmentalization provided the optimal school bus safety system by containing the child passengers within their seating compartment during accidents. Officials insisted that because of compartmentalization, crash forces would be effectively attenuated by the padded surroundings and injuries and fatalities would be mitigated. Parents and their children have accepted and placed their trust in this advice advanced by these transportation officials.

Unfortunately, the standard fell far short of the UCLA findings. NHTSA failed to include the all-important compartmentalizing side panel, and the lap belt; seat back height increase was eight inches lower than the engineers had recommended. As a result “compartmentalization” was significantly compromised, working fairly well for front-end crashes but providing no passenger protection in side impacts and bus rollovers.

Crash Testing:
For the past 25 years and continuing with the current April 2002 “REPORT TO CONGRESS, School Bus Safety: Crashworthiness Research,” NHTSA has persisted in obscuring the absence of lateral and rollover protection by testing and evaluating the 222 seat entirely from a frontal accident configuration.

- Pre-standard testing by AMF Advanced Systems Laboratories in 1975,
- Post-standard tests by NHTSA at East Liberty Ohio in 1978,
- Transport Canada Tests of 1985 involved only front-end crashes and did not measure what happens to passengers in side and rollover accidents.

Finally, as described in the 2002 Report, NHTSA did experimentally place seven, instrumented dummies on a school bus and test crash a 25,000 lb. cab-over truck at 45 mph. into the side of the bus. Curiously, none of the dummies were belted and there was no description of the path of motion and the points of traumatic contact of the dummies during the crash sequence. This failure to compare restraint use with non-restraint is especially significant for those seated away from the impact area, across the aisle on the opposite side of the bus, where in side impacts passengers are thrown violently from their seats and where belts are most effective in reducing injury.

Inexpicably, of the 7 dummies on the bus, only 2 were Side Impact Dummies. (Containing instruments to measure lateral chest and pelvic forces.) Even more troubling is the fact NHTSA chose to place both of these Side Impact Dummies adjacent to the impact sidewall. As a result they were not thrown across the bus by crash
forces mitigating the effect of the side impact crash kinematics and profoundly compromising the data.

It is characteristic of front-end crash sled testing to show the 222 seat to its best advantage and to exhibit lap restraints at their most inefficient. Since the front-end accident configuration occurs only about one-third of the time, reasonable efforts to evaluate school bus safety must also include tests involving side, rear and rollover crash forces. NHTSA has never explained their rationale for failing to properly perform these tests.

Furthermore, testing only those circumstances where the seat will perform well leads to conclusions that serve to exaggerate the safety of school buses and to imply a level of safety that is invalid. By way of example, imagine a vehicle that has good steering but faulty brakes. If only the steering is tested the authorities are able to insist that the vehicle is safe. And no matter how many times the vehicle is tested, if only the steering is checked, the myth of safety continues. In the meanwhile, the inadequacy of the braking system continues to cause accident after accident.

Although from the inception, notice of the failure of the 222 seat to properly “compartmentalize” and to protect during side impact and roll-over accidents has been detailed by this writer to NHTSA in petitions, during public testimony before the Congress and at NHTSA forums, the Agency has persistently chosen to ignore the deficiency.

Identified Harm to Children:
While the motive for the unrelenting denial by NHTSA of this obvious defect is unclear, the resultant harm caused by “compromised compartmentalization” to the children who are passengers is most evident. In September of 1999, just as the NHTSA study was beginning, the National Transportation Safety Board (NTSB) issued a report on school bus crashworthiness. The study found “compartmentalization” was ineffective during six typical school bus accidents. In every example the 222 seat failed to contain the passengers. Children were injured and killed as a result of both ejection and being tossed violently within the bus itself. The Board concluded that:

Current compartmentalization is incomplete in that it does not protect school bus passengers during lateral impacts with vehicles of large mass and in rollovers, because in such accidents, passengers do not always remain completely within the seating compartment.

The Board went on to point out that passengers who were propelled from the “compartment” were the ones more likely to be injured during side impact and rollover collisions.

Re-review of major crashworthiness studies by the NTSB details that compartment failure occurred to unrestrained passengers in every lateral and rollover crash (See attached REVIEW OF MAJOR SCHOOL BUS CRASHWORTHINESS STUDIES BY THE NATIONAL TRANSPORTATION SAFETY BOARD).

Contributing to compartmentalization failure are such factors as the slippery nature of the school bus seat covering, the reduced containment because of the smaller sizes of young children, and the effect of relative opening of the compartment for children seated on or closer to the aisle. In addition, school buses-- because of their high center of gravity are-- relatively unstable and are subject to frequent rollovers.

As the result of the NTSB’s strong recommendations, there was some hope that NHTSA might finally take action to provide belts for the buses.

NHTSA 2002 Report:
After four years of effort and at a cost to taxpayers of hundreds of thousands of dollars, the National Highway Traffic Safety Administration (NHTSA) again failed to properly identify “compromised compartmentalization” as a design defects in school buses and refused to implement needed safety improvements to protect the 25 million children who ride school buses back and forth to school every school day.

In preparing the current April 2002, “REPORT TO CONGRESS, School Bus Safety: Crashworthiness Research,” in order to assess crash outcomes, NHTSA analyzed 31 actual crashes. Just nine (29%) were front end. In spite of the fact that 7 out of 10 of these real world accidents were not frontal, NHTSA made no attempt to evaluate the effectiveness of “compartmentalization” in protecting the young passengers in all real world crash configurations.
Had NHTSA chosen to evaluate the complete range of all accident possibilities, they would certainly have concluded, as did the NTSB, that “compartmentalization” was compromised and incomplete.

Clearly, NHTSA has demonstrated an all-consuming disinterest in the mechanics of the side impact school bus crash. The report devotes only 3 of the 54-page report to the side test. By contrast, the frontal sled tests were carefully evaluated based on different dummy sizes, seat configurations, and restraint systems. Detailed discussions of dummy kinematics for all variables were recorded. In the final analysis however, the information gathered in the frontal sled tests was little different from that developed in the aforementioned pre- and post-standard testing in the 1970s. On the other hand, the side impact test was programmed to produce so little information one must wonder why NHTSA chose to perform the crash at all and how, based on the paucity of data, they could conclude that restraints were not needed in large school buses.

**Cost:** On the very first page of the NHTSA Report, the Agency is careful to quote from a June 25, 1998 letter from Congressman James A. Traficant, Jr. admonishing NHTSA to consider the impact on school districts of requiring occupant restraint systems and design and seating capacity changes. While based on recent events the credibility of Mr. Traficant is questionable (at best), NHTSA’s first responsibility is to establish considerations of safety paramount to and above all concerns for the supposed inconvenience of the districts. As regards cost, school bus officials should consider the following costs of “compromised compartmentalization”:

- A $28 million accident settlement by the Flagstaff Arizona School District for a school bus rollover accident which caused 31 injuries and 5 ejections. One child suffered a head injury that requires long-term care and another was left a quadriplegic after the accident.

- Successful litigation based on the failure of compartmentalization and absence of seat belts with commensurate settlements has occurred in Corpus Christi and Galveston Texas, Cincinnati, Ohio, Philadelphia, Pennsylvania, Columbia, Maryland, and Memphis, Tennessee.

- On March 28, 2000, a train struck the passenger side of a Murray County, Georgia, School District school bus. During the accident sequence, the driver and three children were ejected. Two of the ejected passengers received serious injuries and one was fatally injured. Of the four passengers who remained inside the bus, two were fatally injured, one sustained serious injuries. One, who was restrained by a lap belt, suffered only minor injuries.

- The short-term pain and suffering of those injured and recovering.

- The lifetime of suffering for those with permanent disabilities.

- The cost of litigation should lack of restraints cause injury.

- The increased cost of liability insurance.

NHTSA also argues that the installation of seat belts would cause a 17% loss of seating capacity resulting in substantial additional expenses to school districts. They allege that this is because three restraints cannot be fitted to a 39” seat. As those familiar with school transportation are fully aware, except for children in the earliest grades, no 39” seat can accommodate three students. For NHTSA to assume that all school buses are operating at full capacity with 3 to a seat does not represent reality in school transportation.

**Conclusion:** Once again NHTSA has failed miserably in addressing the problem of “compromised compartmentalization” in school bus side impact and rollover accidents. As a direct result, children will continue to be killed and injured in school bus accidents. Since NHTSA will not act, the responsibility to correct this well documented inadequacy now resides with the Congress.

As an officer of Physicians for Automotive Safety and the National Coalition for School Bus Safety, Dr. Yeager
has been a leader in the enactment of two first in the nation laws in New Jersey, one to require use of seat belts on school buses and another to require use of bicycle helmets. In addition, he has been instrumental in passing legislation raising the drinking age to 21, requiring school buses to have high-back padded seats, roof hatches and crossing gates, child restraint laws, moped helmet use and providing for ice cream truck stop signs. Dr Yeager has been a recipient of the Certificate of Appreciation, US Department of Transportation, the Governor's Highway Safety Award, Johnson and Johnson/Safe Kids, New Jersey Honoree of the Year, and Advocates for Highway and Auto Safety, Safety Leader Award.
School Bus Crashes Raise Concerns About Seat Belts and Safety

Two recent school bus accidents, one in Indiana and the other Washington State, have left one student and a bus driver dead, and scores of students injured, raising new concerns about school bus safety.

In Indianapolis, a bus carrying 50 students, ages 5 to 16, to the Lighthouse Charter School ran into a concrete bridge abutment. The 60-year-old driver of the bus was killed, as was 5-year old student Donasty Smith. Two other students were critically injured.

“A school bus crashed into a bridge, and the school bus driver’s down,” a caller to 911 said.

“OK, are there kids on the bus?” asked the 911 dispatcher.

“Yes,” said the caller. “Just getting them off now.”

The bus was badly mangled, and although some children were able to scramble off the bus with the help of others, four passengers had to be freed by the fire department.

According to ABC News sources it appears preliminarily that the school bus driver either was distracted or had a heart attack while behind the wheel. He appears to have hit the overpass without braking, sources said. Investigators will not be able to rule out a heart attack until an autopsy is performed.

In the other accident, in Quincy, Wash., the school bus rolled over, apparently after it veered off the road and the driver overcorrected. There were 38 students on board. One was critically injured and remains in the hospital. Three were seriously injured and have been treated and released. The bus driver also remains hospitalized.
The accident, about 120 miles east of Seattle, occurred on a rural bus route. The bus picks up students of all ages, from kindergarten to high school. Initial reports are that alcohol, drugs, and the weather, were not factors in the accident.

Neither of the buses was equipped with passenger seatbelts, which the National Highway Traffic Safety Administration does not require in larger school buses. NHTSA and school bus manufacturers say the buses are safe because of their size, and what’s called “compartmentalization.” Buses are designed to hold students in place with the help of narrow widths between seats and high seatbacks.

“We feel strongly that school buses continue to be the safest way to transport students,” NHTSA spokesman Lynda Tran told ABC News. “They are even safer than their parents’ cars.”

The government points to statistics that underscore the safety of school buses, which transport 23 million children a day. According to the NHTSA, about 800 school-aged children are killed in motor vehicle accidents during normal school travel hours each year. Only about 20 of those deaths are school-bus related — an average of five school bus passengers and 15 pedestrians, often students hit inadvertently by the school bus, according to the NHTSA statistics.

But the American Academy of Pediatrics strongly disagrees that seat belts aren’t necessary on school buses. It wants all new buses equipped with lap/shoulder belts to “ensure the safest possible ride”, according to Dr. Phyllis Agran, a pediatrician.

Agran said that according to her research, approximately 17,000 children are treated in emergency rooms annually, having been injured in school buses, with 42 percent of those injuries involving crashes.

School buses are “a dinosaur with respect to occupant protection,” she said. Compartmentalization was a safety concept from the 1960s, before there were mandatory requirements for lap/shoulder belts in motor vehicles, she said. Seat belts in school buses “should be a no-brainer by the year 2012,” she said.

The government strengthened its compartmentalization rule in 2009 to require higher seatbacks in new buses, for even greater protection. As for whether larger buses are equipped with seat belts, that decision has been left up to the states and individual school districts.