Putting Children First

Child and Youth Initiative to Achieve One Level of Safety for All Children

Putting Children First

National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594

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Abstract: This document focuses on what has been and what still needs to be done to protect children from death or injury in transportation-related crashes. The following issues areas are examined:

- Air bags and children
- Permanent child safety seat fitting stations
- Child occupant protection laws
- Car designs that focus on children
- School transportation for children
- Passenger vans used for school activities
- Zero alcohol tolerance for drivers under age 21
- Graduated driver licensing for new and novice drivers
- Recreational boating safety
- Child restraints in aviation

The National Transportation Safety Board is an independent Federal agency dedicated to promoting aviation, railroad, highway, marine, pipeline, and hazardous materials safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The Safety Board makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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National Transportation Safety Board
Public Inquiries Section, RE-51
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594
(800) 877-6799 or (202) 314-6551

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Dear Readers:

The National Transportation Safety Board's mission is to investigate crashes in all modes of transportation and issue safety recommendations to prevent future similar occurrences. Many Americans know about the Safety Board because of its high media profile when investigators probe catastrophic aviation accidents. The Safety Board also investigates crashes in other transportation modes, including highway, rail, maritime, pipeline, and hazardous materials. This document focuses on what has been and what still needs to be done to protect children—our most precious resource—from death or injury in transportation-related crashes.

One of my responsibilities as Chairman of the Safety Board has been to meet transportation accident survivors and victims' families and

friends during very stressful times in their lives. I spend a lot of time listening to their concerns about protecting themselves and their families when they travel. They all emphasize that they don't want another family to endure a similar tragedy.

Many of my conversations are with parents whose children have died in traffic crashes. They all tell me the same thing. They are frustrated at how difficult it is to ensure the safety of their children when traveling by automobile. They are right to be concerned. In the 1990s, more children were hurt and killed in highway accidents than anywhere else.

Here are the grim highway statistics for the last decade:

- More than 90,000 children, infants to teenagers, were killed in motor vehicle crashes, and over 9 million were injured.
- Almost 17,000 children under age 10 died in motor vehicle crashes, an average of 32 children each week.
- Over 15,000 children between ages 10 and 15 died in motor vehicle crashes; on average, 29 children each week.
- Over 63,000 children between ages 15 and 20 died in traffic crashes, more than 122 each week.
- Six out of 10 children who died were not buckled up.
- The vast majority of children under age 8 who *are* buckled up are improperly restrained.
- Ten times more children ride in the front seat of the car than need to (this means a back seat is available for them), even though the back seat is safer than the front seat.

Americans react with horror at random acts of violence that take the lives of innocent children. They demand action when a child is killed in a school firearms incident. In 1997, 191 children under age 10 died in firearms-related actions. That same year, 1,784 children under age 10 died in highway crashes. Although highway crashes are the leading cause of death for children in this country, we do not hear a nationwide outcry every time a young girl or boy dies in a traffic crash. Clearly, the most dangerous place we take our children is on America's highways. Highway tragedies do not discriminate by age, race, or ethnic background. Every child is vulnerable.

That's why the Safety Board is working hard to change the way the Nation thinks about the safety of the smallest passengers and to move the Nation towards a child-safe culture. The Safety Board urges every citizen and every level of government to foster a safety culture that puts child transportation safety at the top of the safety agenda. One level of safety, the highest possible level, should be provided for all children in every State and in every mode of transportation.

This publication outlines many of the tragic lessons learned from accidents involving children as well as the recent changes that have been made to prevent future accidents. It also discusses many of the child safety challenges the Safety Board believes still need to be addressed. We have made progress in the past few years, but there is much more to be done. It is time to stop the tragic and unnecessary loss of our youngest citizens on our highways.

Jim Hall, Acting Chairman
National Transportation Safety Board
November 2000

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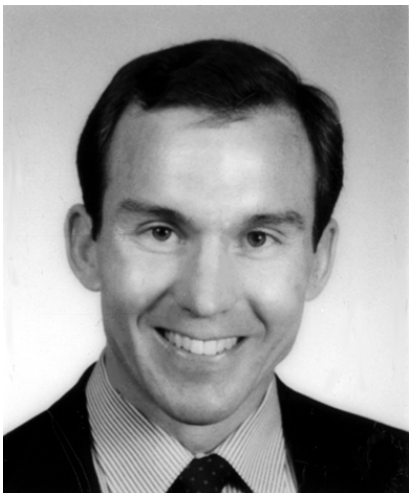
Introduction

Many Americans know that the National Transportation Safety Board is on call 24 hours a day, 365 days a year and that its staff travel to every corner of the world to investigate accidents. What is less known is what results from these investigations. The goal of every investigation is to find the reason for the accident and to try to prevent it from happening again. Therefore, the Safety Board's most important contributions are its recommendations to government and industry. Since Congress created the Safety Board in 1967, more than 100 recommendations have been made suggesting ways to improve the safety of America's children on highways, on waterways, and in the air. This report discusses the Safety Board's recommendations in the following areas of child transportation safety:

- Air bags and children
- Permanent child safety seat fitting stations
- Child occupant protection laws
- Car designs that focus on children
- School transportation for children
- Passenger vans used for school activities
- Zero alcohol tolerance for drivers under age 21
- Graduated driver licensing for new and novice drivers
- Recreational boating safety
- Child restraints in aviation

"Use of personal flotation devices by children on recreational boats and personal watercraft will save lives."

Board Member
John Hammerschmidt



"Child safety seats should be simple for parents and caregivers to use and the instructions should be easy to follow and understand."

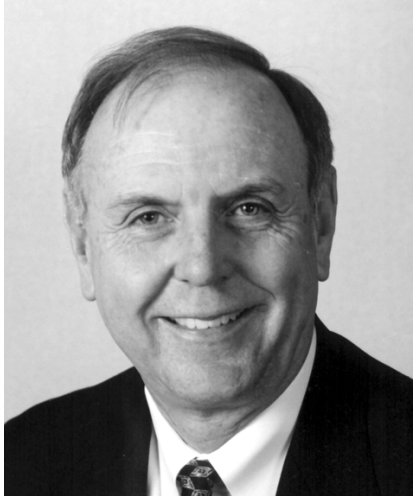
Board Member
John Goglia

A history of some of the major activities by the Safety Board to promote child transportation safety is outlined below.

1983	Child Passenger Protection Against Death, Disability, and Disfigurement in Motor Vehicle Accidents (report)
1985	Child Passenger Safety Symposium: Ways to Increase Use and Decrease Misuse of Child Restraints (report)
1987	Crashworthiness of Large Poststandard School Buses (report)
1989	Crashworthiness of Small Poststandard School Buses (report)
1991	Recommendation Letter on Belt Positioning Booster Seats
1995	Urgent Recommendations on the Dangers that Air Bags Pose to Kids
	Recommendation Letter on Child Restraint Use on Aircraft
1996	The Performance and Use of Child Restraint Systems, Seat Belts, and Air Bags for Children in Passenger Vehicles (report)
1997	Public Forum on Air Bags and Child Passenger Safety (proceedings)

"The most difficult crashes, emotionally, to investigate are those that involve children."

Board Member
George Black



1999 Recommendation Letter on Establishment of Fitting Stations

Speech on Designing Cars for Children Highlighting 1996 Recommendations

Meeting on Simplifying the Design of Child Safety Seats

Pupil Transportation in Vehicles not Meeting Federal School Bus Standards (report)

Bus Crashworthiness Special Investigation (report)

Meeting on the Use of Child Restraint Systems on Aircraft

"Everything from coffee pots to carry-on luggage is secured during airplane take off and landing—why not infants and 1-year-old children?"

Board Member
Carol Carmody

2000 Recreational Boating Safety Initiative for Children

Speech to the Southern Legislative Conference on Child Transportation Safety Improvements Needed in the South

Meeting on the Need for Booster Seats for Use with Lap-only Seat Belts

Establishment of Child Transportation Safety Web Page <http://www.ntsb.gov>

Child Passenger Safety Video

Air Bags and Children

The Problem

In September 1995, a 1994 mid-size car driven by a 26-year-old woman failed to stop for a red light at an intersection and collided with a 1985 compact car. The air bags in the 1994 vehicle deployed at impact, causing minor injuries to the driver. The passenger-side air bag struck the back of the rear-facing child restraint system positioned in the right front passenger seat, breaking it in several places and killing the 5-month-old child in the restraint. A 3-year-old seated in a shield booster seat in the right rear seating position was not injured. All occupants of the other vehicle were wearing their lap/shoulder belts. The driver and the 10-year-old child who was seated in the right rear seating position sustained minor injuries. The adult occupying the right front seat was not injured.

This crash demonstrates the dangers of air bags to small children. Air bags, like seat belts, were designed to protect a 170-pound adult male. They were not designed with children in mind.

Lessons Learned

The Safety Board documented that air bags can kill or critically injure children in accidents that would have been survivable had the air bag not deployed. The insufficient distance between the restraint system and the inflating air bag, in combination with the speed and force at which an air bag can inflate, can be lethal to children. A deploying passenger-side air bag strikes the child in the head and neck as opposed to the upper torso where it typically contacts adults. Designing and certifying a system to protect all occupants using only an average-sized adult male dummy has had tragic results for children.

In 1996, the Safety Board completed a study on the performance and use of child restraint systems, seat belts, and air bags for children in passenger vehicles. The study analyzed data from 120 vehicle crashes that occurred between 1994 and 1996. Vehicle occupants included 207 children under age 11. Air bags deployed in 13 crashes in which a child was seated in the front passenger seat. In 7 of the 13 crashes, the child was either killed or critically injured by contact with the air bag.

The Safety Board convened a public forum in March 1997 to discuss concerns related to the effectiveness of air bags and ways to increase seat belt and child restraint use. The National Highway Traffic Safety Administration (NHTSA) participated, along with representatives from Australia, Canada, and Europe, the automobile industry, air bag suppliers, insurance companies, safety and consumer groups, and family members involved in crashes in which air bags deployed.

As a result of its study and public forum, the Safety Board issued a series of safety recommendations in 1995, 1996, and 1997 on the dangers that air bags pose to small children. The Safety Board recommended that NHTSA, safety advocates, and automakers address air bag safety education and research, and advanced air bag technology, and that they revise air bag performance standards.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- The automobile industry sent letters and warning labels to owners of 60 million cars currently on the road that are equipped with air bags, advising the owners about the dangers that air bags pose to children.
- NHTSA required highly visible and permanent warning labels about the dangers that air bags pose to children in all newly manufactured air bag-equipped vehicles and on child restraint systems, effective February 1997.
- NHTSA and the automobile and insurance industries initiated an air bag safety campaign in May 1996. The goal of the Air Bag and Seat Belt Safety Campaign, as it is known today, is to educate the public about the importance of putting children in the back seats of vehicles with air bags, buckling up everyone in the car, strengthening State seat belt use laws, and increasing enforcement of the laws.
- Since May 1997, automobile manufacturers have been permitted to install depowered air bags in newly manufactured vehicles. This change is a first step to reduce the risk of air bag-induced injuries to children, short-statured adults, and senior citizen occupants.
- Certain at-risk occupants now can apply for permission from NHTSA to install on-off switches for one or both front air bags.
- In May 2000, NHTSA established performance criteria for advanced air bags that will be safe for occupants of all ages and sizes.
- Child passenger safety literature now advises that children age 12 and under ride in the back seat of a vehicle that has front passenger air bags.

Permanent Child Safety Seat Fitting Stations

The Problem

In January 1999, a young mother was driving with her 7-month-old son in the back seat in a forward-facing child safety seat. As she made a left turn, she collided with a school bus traveling in the opposite direction. The car spun around, striking two other vehicles. The infant was ejected from the car and killed. The mother survived with moderate injuries.

The mother thought she had done everything possible to protect her child. Safety Board investigators learned that the child safety seat was installed in the car correctly, but the child had not been properly secured in the seat. The shoulder straps were improperly positioned, the wrong latch position was used, and the shoulder strap clip was too low.

Courtesy DaimlerChrysler

Courtesy General Motors

Lessons Learned

The Safety Board's 1996 study on child passenger safety examined whether child restraint systems were properly used, and found that in 62 percent of the cases, the restraint was improperly secured in the vehicle and/or the child was improperly secured in the child restraint. This high level of child safety seat misuse was consistent with the findings of both a 1983 Safety Board report and a 1985 Safety Board symposium on child restraint misuse.

Problems encountered in using child safety seats include seat belts misrouted around the safety seat or left too loose, locking clips not used on seat belts as needed, child restraints facing the wrong direction (usually forward-facing rather than rear-facing), and the safety seat harness adjusted too loosely, inappropriately threaded through the wrong slots, or not fixed to avoid loosening. In 2000, the Safety Board estimated that about 10 million children were traveling in misused safety seats.

The Safety Board called on child restraint manufacturers to make child safety seats easier to use. Research shows that although 96 percent of parents think they have installed their child's car seat correctly, 8 out of 10 have not. Use of a safety device must be simple and intuitive.

Properly used child restraints have proven to be effective in reducing the likelihood of death and injury to children. NHTSA estimates that the potential effectiveness of child restraints, when used correctly, is 71 percent. When children are improperly secured in child restraints or child restraints are improperly installed in vehicles, the effectiveness of child restraints drops to 59 percent.

To assist parents and caregivers in properly installing their child safety seats, in 1999 the Safety Board asked the States, automobile and child restraint manufacturers, and NHTSA to support the establishment of child safety seat fitting stations.

Fitting stations, staffed by trained and certified child safety seat technicians, provide hands-on instruction to parents and caregivers on proper child safety seat selection and installation. Fitting stations can be established at automobile dealerships, automobile repair stations, firehouses, health centers, or wherever annual motor vehicle safety inspections are done. These stations provide a stable resource for parents and should be easily accessible and available at times that are convenient for parents and caretakers.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

Auto Manufacturers

- DaimlerChrysler established *Fit for A Kid*, a nationwide program of permanent fitting stations, at selected dealerships. By the end of 2000, *Fit for a Kid* services will be available in all 50 States, and much of the U.S. population will be less than an hour's drive from a *Fit for A Kid* location.
- General Motors established mobile fitting stations in every State in partnership with the National Safe Kids Campaign. GM presented Safe Kids with 51 colorfully decorated minivans that are used to bring child safety seat inspections to shopping centers, auto dealerships, and other locations in communities in every State and the District of Columbia.
- Ford Motor Company established the "Boost America" program to provide support for existing community fitting stations and to implement a campaign to give away booster seats to needy families. Ford is also conducting child safety seat inspections through its program.
- BMW initiated a 6-month program, the "Ultimate Child Safety Seat Clinic." BMW sent certified instructors to over 200 of its dealerships to conduct 1-day safety seat inspections in conjunction with a charitable fund-raising event that BMW sponsors.
- A Toyota dealer in Alexandria, Virginia, donated a Toyota Quest to the Alexandria Police Department. Named "Baby-1," the van is used to conduct safety seat inspections at various locations around the city.

Logos from auto manufacturer child safety programs

States

- In Connecticut, 24 state troopers have been certified as child seat safety technicians, and 30 local police departments or medical facilities have certified technicians. Some of these locations have established permanent and regularly scheduled dates and locations for child safety seat clinics.
- In the District of Columbia, a permanent fitting station has been established at the Division of Motor Vehicles. The fitting station is open two afternoons a week and the third Saturday of each month. Other permanent locations are planned.
- In Florida, every county sheriff's office and city police station serve as fitting stations and every traffic law enforcement officer has been trained to provide assistance.
- Hawaii has four permanent fitting stations currently in operation, and 13 more are expected to be operational by the end of 2000.
- Idaho has seven permanent locations located at the seven health district offices in major metropolitan areas in addition to periodic safety seat checkup events held at other locations.
- Indiana has 13 fitting stations at fire stations, police stations, home extension offices, medical facilities and other businesses and a toll free number that provides the telephone number of a certified technician in the caller's local area.
- Iowa is piloting two model fitting stations. One is at a 24-hour emergency medical facility. The other is being promoted and advertised by U.S. Cellular and staffed by the Central Iowa Traffic Safety Task Force. It is open every Thursday evening and every third Saturday of the month.
- Kansas has 89 certified technicians. Corporate sponsors established fitting stations with the assistance of the Department of Transportation's safety contractors.
- Kentucky is coordinating the establishment and implementation of permanent fitting stations at Department of Transportation local district offices throughout the Commonwealth. The State set a goal to have a minimum of 13 permanent stations by the end of 2000. In addition, the Police Department in Paducah, Kentucky, operates a fitting station at police headquarters.

- Maine is establishing 16 permanent fitting stations, 1 in each county.
- Missouri established 26 permanent fitting stations in addition to 10 fitting stations at automobile dealerships.
- New Jersey has over 200 certified technicians. Permanent fitting stations were started by county agencies in 4 of 21 counties; at least 3 more are expected by the end of 2000.
- New Mexico is considering a pilot test of four permanent fitting stations and is also examining the use of five portable fitting station "kits" that can be used at regularly scheduled locations.
- New York has established 57 permanent fitting stations and plans to expand its program.
- South Carolina is establishing pilot fitting stations in two counties.
- West Virginia currently has 20 fitting stations and plans to establish 30 more over the next year. In addition, fitting stations will be established in each of the 17 regional offices of the Division of Motor Vehicles.
- Northern Mariana Islands designated four fire stations on the island of Saipan as permanent inspection stations.
- Many other States and organizations conduct either regular or occasional child safety seat clinics; that is, the location and frequency of their child safety seat inspections vary.

Child Restraint Manufacturers

- Britax Child Safety, Inc. has developed retailer fitting stations. These fitting stations use an in-store "demo rig" to demonstrate proper installation of Britax child restraints. Britax requires all retailers to own and use this rig as a condition of selling its Roundabout child restraint. The company has teamed with BMW in the Ultimate Car Safety Seat Clinic program.
- Fisher-Price has partnered with DaimlerChrysler to establish their nationwide *Fit for A Kid* program.
- E-Z-On Products, a manufacturer of child safety harnesses, provides child seat technician training.

NHTSA

- NHTSA has indicated its intention to develop a guidebook for States to use in establishing and operating fitting stations.

Child Restraint Laws

The Problem

The Safety Board's 1996 child passenger safety study involving more than 180 restrained children showed that the children tended to be restrained in systems too advanced for their physical development. For example, the report showed that 52 children used vehicle seat belts when they should have been placed in child restraint systems or booster seats.

In the summer of 1996 in Washington State, a 4-year-old, 45-pound boy was buckled into a lap/shoulder belt by his mother in accordance with State law. When their sport utility vehicle rolled over in a violent crash, the boy's lap/shoulder belt remained buckled, but the young boy was ejected from the restraint and the car, and killed.

The Centers for Disease Control and Prevention (CDC) issued a report in February 1999 indicating that 4- through 8-year-olds are not being protected because of gaps in the State laws that govern child safety seats. As a result, the CDC estimates that almost 500 children die on our highways every year because they are not properly secured in restraint systems—booster seats—that are appropriate for their age, height, and weight.

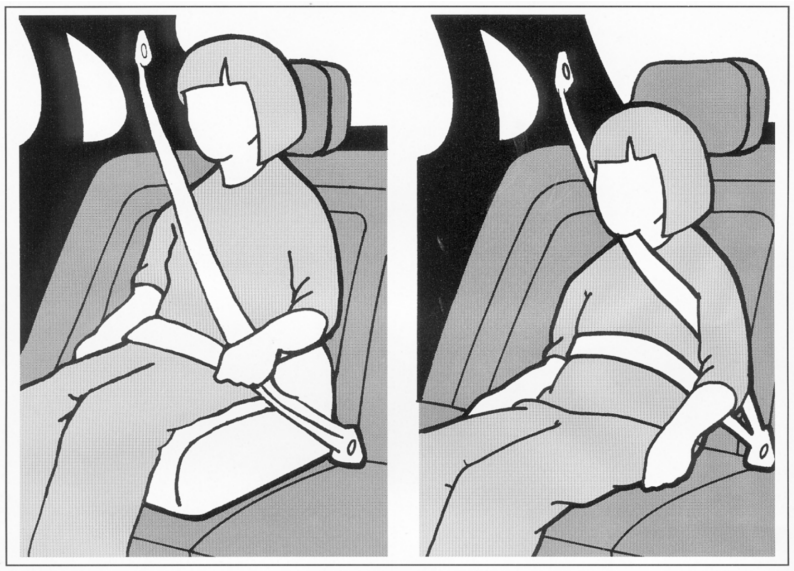


Illustration on left

"Illustration on left shows proper fit of the combination of an adult safety belt with a child booster seat. By raising the child, the booster seat allows the lap belt to be properly positioned low across the thighs, while the shoulder belt is over the collarbone and away from the neck. In the event of an accident, the child would be properly restrained."

Illustration on right

"Illustration on the right shows why booster seats are needed to make adult-size safety belts work properly. Without the booster seat, the safety belt is incorrectly positioned over the stomach and across the neck. In the event of an accident, this could cause serious injury. Utilizing a booster seat also allows for a more comfortable ride for a child."

Courtesy BoostAmerica

Lessons Learned

Seat belts, like air bags, were designed for adults. Children need to be almost 5 feet tall before the vehicle lap/shoulder belt will fit them properly. Although all 50 States and the District of Columbia have child passenger protection laws, in 1996, the Safety Board called on the States to strengthen their child restraint laws to do the following:

- Require all children under 4 years old to be in child safety seats.
- Require that 4- to 8-year-old children use auto safety booster seats.
- Eliminate provisions that permit children under 8 years old to be buckled up in a seat belt.
- Require all children under age 13 to ride in the back seat, if a seat is available.

Twenty-eight States and the District of Columbia require children of all ages (infants through teenagers) to be buckled up, although most permit seat belts to be substituted for child safety seats or booster seats. Only eight States require all children age 4 and under to be in child safety seats.

In addition, 6 out of 10 children killed in traffic crashes are not buckled up at all. The number of children killed each year could be reduced by 50 percent if every child were buckled up. There should be no tolerance for unbuckled children. State child restraint laws should be enforced and supported to reduce the number of children killed and injured in traffic crashes.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- Washington State and California enacted laws in 2000 to require children under 6 years of age or 60 pounds to ride in a booster seat.
- Delaware, North Carolina, and Rhode Island require children to ride in the back seat of air bag-equipped cars. In Louisiana, all children less than 13 years of age must ride in the rear seat when one is available.
- NHTSA recently began an education campaign "Boost 'em before you Buckle 'em" to ensure that 4- to 8-year-olds get buckled up in age-appropriate restraint systems.

Designing Cars for Child Safety

The Problem

Most automobile safety features, such as seat belts, have been developed based on crash testing with a 170-pound adult male dummy. Safeguards that work for a person of this size are not always appropriate for children. Not enough attention has been paid to designing vehicles to protect the children riding in them. This is evident from the tragic consequences of air bag deployment on rear-facing infant seats in the front seating position of a vehicle with a passenger-side air bag, and the injuries that small children can sustain from seat belts that do not provide equal protection for them as they do for adults.

Lessons Learned

Research by the Insurance Institute for Highway Safety in June 1999 indicates that the rear seat of a vehicle is the safest seating position for children. Putting a child in the back seat can reduce the risk of death by 35 percent in cars without air bags and by 53 percent in cars with air bags. Currently, 10 times more children ride in the front seat of the car than need to (that is, a back seat is available for them). In the center back seat position, the child is farthest from any impact in the event of a crash. NHTSA's Fatality Analysis Reporting System (FARS) data shows that 46 percent of all back-seat occupants seated in the center position are under the age of 13. Currently, the back seats of vehicles are designed for a mid-size adult male.

Car designed with built-in booster seats.
Courtesy National Highway Traffic Safety Administration

As a result of a 1996 child passenger safety study, the Safety Board issued a series of safety recommendations, related to design of vehicles, that asked for center lap/shoulder belts in the back seats to permit use of belt-positioning booster seats by 4- to 8-year-old children, adjustable upper anchorages on rear seat shoulder belts for better fit once children have outgrown their booster seats, and built-in child safety seats that eliminate compatibility problems between the vehicle's seat belt and child safety seat. In an April 1999 speech before the World Traffic Safety Symposium in New York City, Safety Board Chairman Jim Hall challenged automobile manufacturer design and engineering teams to consider what they can do to put children first when designing vehicles in the future.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- Built-in child safety seats are now available on certain vehicles including the Chevrolet Venture, Chrysler Town and Country, Dodge Caravan, Mercury Villager, Nissan Quest, Plymouth Voyager, Pontiac Montana, Saab (93 and 95 models), Subaru Legacy, and Volvo (S40, S80, and V40 models).
- Shoulder belts have been required in rear outboard seating positions since 1990. Automakers now provide shoulder belts as standard equipment in the center rear seat position of most model vehicles.
- Shoulder belt anchor locations have been lowered in some vehicles to better fit older children who no longer need a child safety or booster seat.
- Automakers are designing entertainment features for cars that encourage children to sit in the back seat.
- More child-size dummies are available for crash testing to enable automakers to see how safe cars are for children.
- NHTSA will require a special child safety seat latch in automobiles, effective 2002, to eliminate compatibility problems.

School Transportation for Children

The Problem

In 1997, the Safety Board investigated a school bus accident near Monticello, Minnesota. The school bus was traveling about 45 miles per hour through an intersection when it was struck by a dump truck with a semitrailer, traveling about 50 mph. The dump truck driver ran a stop sign, skidded into the intersection, and was struck by the front of the school bus. A second impact occurred when the right front corner of the semitrailer struck the left side of the school bus. A third impact occurred when the semitrailer slapped the side of the school bus as the bus was rotating clockwise. The school bus was occupied by an adult driver and 13 passengers, ages 6 to 11. The truck driver and three bus passengers seated in the left rear of the bus were fatally injured. One bus passenger sustained critical injuries, two sustained severe injuries, and three sustained serious injuries. The school bus driver and one passenger sustained moderate injuries, and three passengers sustained minor injuries.

Current large school bus occupant protection regulations are based on a concept called compartmentalization: the seats are strong, closely spaced together, high backed, well padded, and designed to absorb energy during a crash. This concept evolved from both crash testing research and Federal rulemaking by NHTSA.

This accident and five others investigated for the Safety Board's 1999 *Bus Crashworthiness Special Investigation Report* demonstrated that passenger fatalities and serious injuries may occur away from the area of initial vehicle impact. This represents a departure from the circumstances in previous school bus accidents investigated by the Safety Board in which the fatalities and serious injuries routinely occurred in the initial impact areas.

Lessons Learned

During the investigation of the six accidents mentioned above, the Safety Board learned that although compartmentalization is an effective means of protecting children in school bus accidents, current compartmentalization is incomplete. It does not protect passengers during lateral (side) impacts with vehicles of large mass or in rollovers, because in such accidents, passengers do not always remain completely within the seating compartment.

The school bus seat in use today is a 23-year-old design. The Safety Board believes that installing obsolete technology (lap belts) in school bus seats that were never designed for them is the wrong solution to improve school bus occupant protection. The right solution, and the one that Board has recommended, is to develop a seating system that restrains passengers within the seating compartment throughout the accident sequence that accounts for frontal impact collisions, side impact collisions, rear impact collisions, and rollovers.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- NHTSA has performed school bus crash tests as a result of the Safety Board's school bus accident investigations. NHTSA is conducting a research program to evaluate the next generation of school bus seating systems.

Passenger Vans Used for School Activities

The Problem

In 1998, the Safety Board investigated an accident in East Dublin, Georgia, in which a 15-passenger van, occupied by a driver, five children ages 4 and 5, and an adult aide, collided with another vehicle. The van was transporting children from their homes to a Head Start Program center. When the van reached an intersection of a major road, its driver drove through a stop sign, entered the intersection, and hit a pickup truck operated by a 17-year-old driver. A 4-year-old child was ejected from the van and died. The van's driver was seriously injured, and the other van occupants received minor injuries. The pickup driver was killed. Eight of the van's 10 windows were shattered in the accident. If the occupants had been riding in a regular school bus with federally mandated crash protection, the van would probably have sustained less damage, resulting in fewer and less severe injuries to the passengers.

Lessons Learned

These vans are referred to as non-conforming buses because they do not have the same requirements for occupant protection, joint strength of body panels, or roof rollover protection that ensure passengers in "yellow" school buses that meet Federal standards and have a higher degree of passenger safety. Further, these vehicles do not have compartmentalized interiors. A 1999 Safety Board special investigation on non-conforming buses showed that some school districts, daycare centers, and contract transportation companies are using vans, tour buses, and other specialty buses for student transportation and therefore do not provide the same level of protection as standard-size school buses.

Based on four accidents investigated for the 1999 non-conforming bus report, the Safety Board asked the States and the District of Columbia to require all vehicles transporting 10 or more children to and from school and school-related activities to use vehicles that meet school bus structural standards.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- Several affordable vans have been designed to meet the more protective Federal standards.
- Insurance companies have begun to recognize the safety advantages of school buses over vans, and some will no longer insure operators that use vans to transport children.
- South Carolina enacted legislation in 2000 to phase out the use of non-conforming buses by private schools and others.

Minimum Drinking Age and Zero Alcohol Tolerance Laws for Drivers Under Age 21

The Problem

Motor vehicle crashes are the leading cause of death for young persons between 15 and 20 years of age, according to the U.S. Department of Transportation's FARS, constituting nearly 36 percent of all deaths in this age group. In 1998, 2,210 teens were killed in alcohol-related crashes. A young driver has a higher risk of a fatal crash than an older driver at all blood alcohol concentration (BAC) levels. Teenage drinking and driving is especially risky, even at relatively low alcohol levels. At BAC levels of 0.01 to 0.049 percent, young male drivers have six times the crash risk of drivers over age 25 within the same range of BAC levels, according to the FARS data.

Although this issue receives the most attention during prom and graduation season, the greatest number of youth alcohol-related fatalities occurred in July and August in 1999. Also, youth alcohol-related fatalities are more frequent in the fall months than in spring months, possibly because of the emphasis placed on alcohol-free prom and graduation activities.

Lessons Learned

Campaigns for alcohol-free prom and graduation events suggest a need to expand successful prom and graduation alcohol awareness programs to fall social events.

Studies in the 1970s and 1980s showed that crashes and fatalities could be reduced if all States enacted laws making 21 the minimum drinking age. In 1982, the Safety Board recommended that States that had not already done so, adopt age 21 as the minimum age for purchase and possession of alcohol.

In 1993, in its evaluation of youth crashes and fatalities, the Safety Board found that youth were still over-represented in crashes and that additional measures were needed to reduce youth fatalities, including alcohol-related fatalities. That year, the Safety Board issued several safety recommendations asking States to enact comprehensive zero alcohol tolerance laws that would prohibit drivers under the age of 21 from driving with a measurable BAC (any level above a 0.00 BAC).

The Safety Board also urged the States to review their minimum drinking age laws to eliminate deficiencies, to vigorously enforce such laws to reduce purchase of alcoholic beverages by persons under the age of 21, and to vigorously enforce license actions against underage purchasers and against vendors who sell to underage purchasers. In 1980, 49 percent of all fatally injured drivers under 21 had BACs of 0.10 percent or greater. This proportion declined dramatically as States raised minimum purchasing ages, and by 1998 the percent of fatally injured drivers under age 21 with BACs of 0.10 percent

or greater had declined to 22 percent, the biggest improvement for any age group, according to the FARS data.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- All States and the District of Columbia now have 21-year-old minimum drinking age laws, saving an estimated 18,220 lives between 1975 and 1998.
- Twenty-three States and the District of Columbia passed stronger youth drinking and driving laws. In 1998, Louisiana became the 50th State to prohibit alcohol sales to minors (persons under age 21).
- Eleven States and the District of Columbia adopted laws to prevent attempts to purchase alcohol.
- Two States and the District of Columbia have made it illegal for minors to purchase alcoholic beverages.
- One State and the District of Columbia have criminalized possession of alcoholic beverages by minors.
- Five more States have prohibited consumption; two States have prohibited the misrepresentation of one's age to purchase alcoholic beverages.
- Nine States and the District of Columbia have made it illegal to possess or use false identification.
- A majority of States have conducted enforcement programs ("stings" and "Cops in Shops") to reduce underage alcohol sales and purchases.
- All States and the District of Columbia have set a BAC limit of 0.02 or lower for drivers under the age of 21.

Courtesy National Highway Traffic Safety Administration

Young Drivers: Graduated Driver Licensing

The Problem

Novice drivers, especially young novice drivers under age 20, have a higher crash rate than more experienced drivers, according to FARS data. While traffic crashes account for approximately 2 percent of all deaths, they account for 36 percent of all deaths among 15- to 20-year-olds. In 1998, teen drivers constituted only 6.9 percent of licensed drivers, but were involved in 14.4 percent of all highway fatalities. About 20 percent of their driving occurred at night, but about 50 percent of their fatalities occurred during the hours of darkness. Analysis by NHTSA in 1998 of crashes among first-year drivers (primarily ages 16 and 17) indicates that they have twice the average number of crashes and, on a miles-driven basis, four times the number of crashes of more experienced drivers.

A 1998 NHTSA report shows that there are certain characteristics of fatal crashes involving young novice drivers:

- The drivers and passengers frequently are not belted (almost two-thirds of fatalities).
- The cars are loaded with the drivers' peers (58 percent of fatalities in young driver crashes are peers of the young driver; 75 percent where the young driver had been drinking).
- Often there is a deadly combination of inexperience and immaturity (16-year-old drivers have the highest fatal crash rate per mile driven).

When night driving and alcohol are added to the equation, crash risk increases dramatically while safety belt use decreases. These crashes are preventable and legislative measures have been successful in reducing both crashes and fatalities.

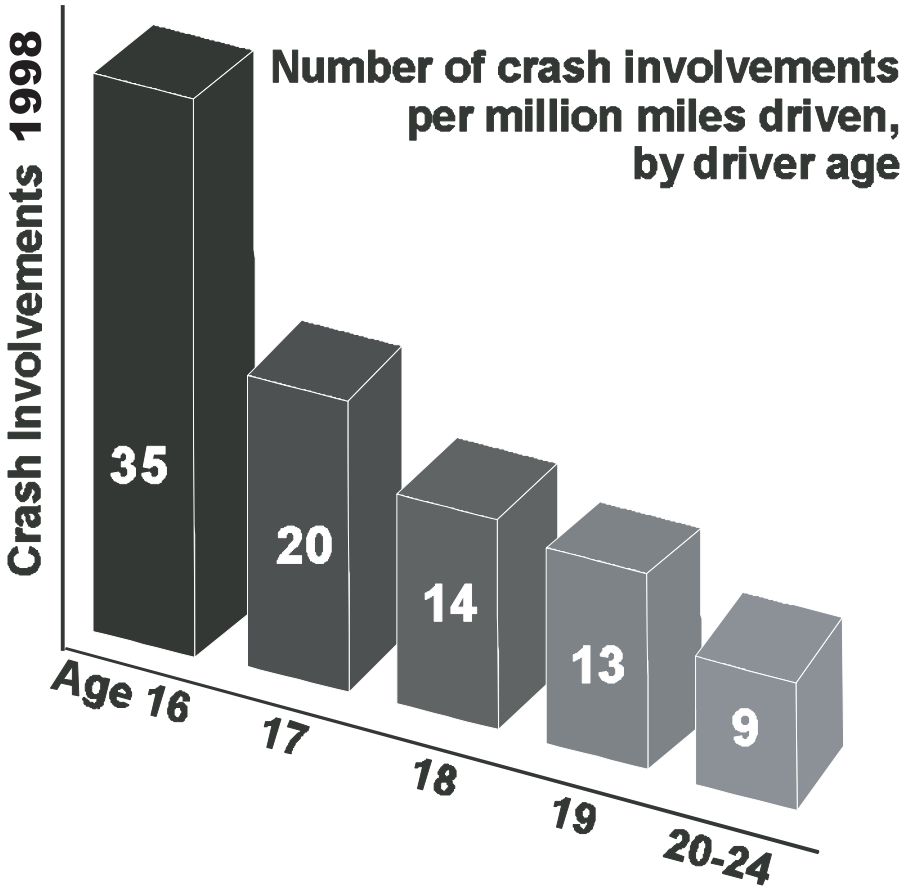
Lessons Learned

In 1993, the Safety Board examined the issue of crashes involving young drivers. Based on its review, the Safety Board issued two safety recommendations urging that States enact laws to provide for a graduated license system for young drivers. Graduated driver licensing core elements include a three-phase system, including a learner's permit, a provisional license, and then full licensure; a 6-month minimum holding period for both the learner's permit and the provisional license; nighttime driving and teenage passenger restrictions; and a supervised driving requirement to increase driving experience.

States can reduce crashes involving young novice drivers by enacting graduated driver licensing to help young drivers learn to drive in the safest possible environment, to help teens acquire ample driving experience in supervised situations, and to reward teens for driving safely. Tennessee's graduated licensing law provides a model. Tennessee has a mandatory 6-month minimum holding period for a learner's permit and a mandatory 1-year minimum holding period for an intermediate license. Young drivers also have a

nighttime driving restriction, and the number of teens allowed in their car without an adult present is limited. Learners must have 50 hours of driving experience, including 10 hours at night, before they can obtain their intermediate license. To move to each of the two higher levels, young drivers must have a clean driving record. As a result, only good driving habits are rewarded and reinforced.

Research by Florida and North Carolina validates the value of graduated licensing laws. Subsequent evaluation of Florida's graduated license law that took effect on July 1, 1996, determined that the law resulted in a 9-percent reduction in fatality and injury crashes among 15- to 17-year-old drivers. The North Carolina law became effective on December 1, 1997. In 1998, despite an increase of nearly 500,000 new drivers, the number of youth fatalities declined slightly, and the youth fatal crash rate continued to decline. A July 2000 report by the University of North Carolina indicated that North Carolina's graduated licensing law is being credited with a 29-percent decline in crashes involving 16-year-olds. The law had an even greater effect on nighttime crashes: it reduced late night crashes for 16-year-old drivers by 47 percent. In addition, the law was credited with a 9-percent crash reduction for 17-year-olds.



Courtesy Insurance Institute for Highway Safety

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- The National Committee on Uniform Traffic Laws and Ordinances developed a model graduated licensing law for use by the States in 1996 and incorporated it into the Uniform Vehicle Code in 2000.
- Twenty-nine States (California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Hampshire, New Mexico, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Washington, West Virginia, and Wisconsin) and the District of Columbia have enacted comprehensive graduated licensing systems.
- Fifteen more States have licensing laws that include at least one element of the comprehensive graduated licensing program.
- Thirty-two States (California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Washington, West Virginia, and Wisconsin) and the District of Columbia have enacted nighttime driving restriction provisions for young novice drivers.

Child Safety in Recreational Boating

The Problem

In June 1997, a 25-year-old man lost control of a rented personal watercraft (PWC), more commonly known as a jet ski, at a water park. The vessel entered a lifeguard-supervised swimming area and struck six children, ages 5 to 12. It hit another person on the beach before coming to a stop. All of the children were injured, including one who suffered severe lacerations and remained in a coma for 3 days. The accident was the result of excessive speed and the operator's inability to control the craft. He had never driven such a vehicle before and had been riding it for less than an hour when the accident occurred. This is one of more than 1,700 police reports on PWC accidents examined by the Safety Board.

Lessons Learned

Safety Board studies and investigations over the years show that our waterways are becoming as congested and dangerous as our highways. As recreational boat use increases, so does the potential for more accidents, injuries, and fatalities. Each year, millions of children are among an estimated 80 million people participating in recreational boating activities on 50 million acres of lakes, on 633,000 miles of rivers, and along 88,633 miles of coastline.

In 1993, the Safety Board asked the States to consider requirements for demonstration of safe boating skills and knowledge of boating safety rules, operator licensing, and mandatory use of personal flotation devices (PFDs) for children. The Board's study of recreational boating safety found that of the 36 children who survived the accidents examined in the study, 15 lives were saved because the children were wearing a PFD.

In 1998, the Safety Board published a safety study on PWC. The Safety Board urged the States, local authorities, and the Coast Guard to require the use of PFDs by all persons, including children, aboard a PWC. The Safety Board also urged boating education for young people who are allowed to operate high-powered vessels, and training requirements for any young person who rents a PWC.

Safety Improvements

Actions taken subsequent to the Safety Board's recommendations include the following:

Courtesy Boat/U.S.

- The American Academy of Pediatrics, the National Association of Boating Law Administrators, and the U.S. Coast Guard established age 12 and under as the ages that a child on a recreational vessel should be required to wear a PFD.
- Thirty-six States and one territory currently require the mandatory use of PFDs by children, although the age of the child varies.
- Twenty States currently have some mandatory boating safety education requirements for children and young operators.
- The Personal Watercraft Industry Association supports efforts to require boater education for PWC operators and mandatory use of lifejackets for all persons on-board PWC.
- The recreational boating industry recommends that children under 16 years of age not be permitted to operate a PWC and that anyone renting one must be at least 18 years old.
- PWC manufacturers are exploring such new technologies as off-throttle steering and collision avoidance systems that will make PWC safer for children and adults as both operators and passengers.

Child Safety in Aviation

The Problem

In 1994, the Safety Board investigated an accident in which a DC-9 passenger jet crashed during a storm while landing at Charlotte, North Carolina. A lap-held 9-month-old baby received massive head injuries after being torn from its mother's arms, and died. The mother, properly belted and restrained, survived, receiving far less serious injuries. During take-off, landing, and turbulence, adults are required to be buckled up, baggage and coffee pots are stowed, computers are turned off and put away, yet infants and toddlers need not be securely restrained.

Lessons Learned

As a result of investigations, the Safety Board in 1990, 1994, and 1995 urged the Federal Aviation Administration (FAA) to require one level of safety for all passengers, no matter their age. The Safety Board believes that all occupants should be restrained during takeoff, landing, and turbulent conditions and that all infants and small children should be restrained in an approved child restraint system appropriate to their height and weight.

At this writing, the Safety Board is investigating an accident that occurred in June 1999, involving a McDonell-Douglas MD-82 that crashed after landing at Little Rock, Arkansas. Thunderstorms with heavy rain were in the area at the time of the accident. The airplane departed the end of the runway, went down an embankment, and hit approach light structures. Eleven persons were killed, and 45 were seriously injured. A 2-year-old child buckled into a child restraint system survived the impact.

Safety Improvements

Actions taken subsequent to the Board's safety recommendations include the following:

- The FAA initiated an information campaign in 1996 strongly recommending that all children who fly, regardless of their age, use the appropriate restraint based on their size and weight. This campaign emphasized that use of an approved child restraint system on an aircraft enhances child safety in the event of turbulence or an accident.
- The FAA initiated preliminary rulemaking to require child safety seat use for children on airlines in 1998.
- In December 1999, at a Safety Board-sponsored meeting, the FAA Administrator announced her intention to require that all children be restrained on aircraft.

More Safety Challenges

This publication chronicles many of the safety improvements made to date that reduce the potential for death and injuries to America's youngest travelers. There is much more to do. Forty-six of the Board's more than 100 safety recommendations to improve child transportation safety are still awaiting implementation. These recommendations are listed below and are identified by a Safety Board designation. The first letter represents the transportation mode, followed by two digits representing the year. That is followed by the number of the recommendation in that mode. The Safety Board's unfinished list of improvements that still must be made include the following:

A-95-50

The NTSB recommends that the FAA develop standards for forward-facing, integrated child safety seats for transport category aircraft.

A-95-51

The NTSB recommends that the FAA revise 14 *Code of Federal Regulations* (CFR) parts 91, 135, and 121 to require that all occupants be restrained during takeoff, landing, and turbulent conditions, and that all infants and small children be restrained in a manner appropriate to their size.

H-83-40

The NTSB recommends that the governors of the 50 States and the Mayor of the District of Columbia review state laws and regulations, and take any necessary legislative action, to ensure that vehicles designed to carry more than 10 passengers and weighing less than 10,000 pounds gross vehicle weight rating (GVWR) used to transport children to and from school, school-related events, camp, day care center, or similar purposes meet all Federal motor vehicle safety standards (FMVSS) applicable to small school buses.

H-96-13

The NTSB recommends that the States, governors, legislative leaders, and the District of Columbia emphasize the importance of transporting children in the back seat of passenger vehicles through educational materials disseminated by the state. Consider setting aside one-tenth of 1 percent from all motor vehicle insurance premiums for policies written to establish a highway safety fund to be use for this and other safety efforts.

H-96-14

The NTSB recommends that the legislatures of the 50 States, the U.S. Territories, and the District of Columbia review existing laws and enact legislation, if needed, that would ensure that children up to 8 years old are required by the State's mandatory child restraint use law to use child restraint systems and booster seats.

H-96-15

The NTSB recommends that the legislatures of the 50 States, the U.S. Territories, and the District of Columbia review existing laws and enact legislation, if needed, that would eliminate exemptions for children to substitute seat belts in place of child restraint systems.

H-96-16

The NTSB recommends that the legislatures of the 50 States, the U.S. Territories, and the District of Columbia review existing laws and enact legislation, if needed, that would require children 8 years old or older to use seat belts in all vehicle seating positions.

H-96-18

The NTSB recommends that NHTSA immediately revise Federal Motor Vehicle Safety Standard 208, "Occupant Crash Protection," to establish performance requirements for passenger-side air bags based on testing procedures that reflect actual accident environments including pre-impact braking, out-of-position child occupants (belted and unbelted), properly positioned belted child occupants, and with the seat track in the forward most position.

H-96-20

The NTSB recommends that NHTSA establish a timetable to implement intelligent air bag technology that will moderate or prevent the air bag from deployment if full deployment would pose an injury hazard to a belted or unbelted occupant in the right front seating position, such as a child who is seated too close to the instrument panel, a child who moves forward because of pre-impact braking, or a child who is restrained in a rear-facing child restraint system.

H-96-22

The NTSB recommends that NHTSA review, through its blue ribbon panel comprising child passenger safety advocates, automobile and child restraint manufacturers, and automobile insurance providers, the various efforts that promote child passenger safety, and then develop and implement a plan to ensure coordinated, comprehensive, continuing programs and stable funding for these programs.

H-96-25

The NTSB recommends that NHTSA revise FMVSS 213, "Child Restraint Systems," to establish performance standards for booster seats that can restrain children up to 80 pounds.

H-96-27

The NTSB recommends that NHTSA revise FMVSS 213, “Child Restraint Systems,” to include performance requirements for seat belt adjusters.

H-96-30

The NTSB recommends that the domestic and international automobile manufacturers develop and implement a program to reduce the misuse of child restraint systems that would include elements such as technical training for dealership personnel in the proper use of child restraint systems and promotional events at dealerships to provide parents and caregivers with info on proper use.

H-96-34

The NTSB recommends that Babyhood Industries; Century Products; Cosco, Inc.; Evenflo; Fisher-Price; Gerico, Inc.; Kolcraft; and Nissan Motor Corporation evaluate, in conjunction with NHTSA, the design of child restraint systems, with the goal of simplifying placement of a child in a restraint system.

H-96-35

The NTSB recommends that Babyhood Industries; Century Products; Cosco, Inc.; Evenflo; Fisher-Price; Gerico, Inc.; Kolcraft; and Nissan Motor Corporation simplify the written and visual instructions provided to consumers regarding the installation of child restraint devices.

H-97-1

The NTSB recommends that the legislatures of the 50 States, the U.S. Territories, and the District of Columbia enact legislation to require transporting children 12 years old and younger in a rear seat of a passenger vehicle if a rear seating position is available. The child should be restrained in accordance with the State's child restraint law.

H-97-5

The NTSB recommends that the governors and the legislatures of the 50 States, the U.S. Territories, and the District of Columbia encourage and support by enforcement organizations to conduct dedicated and highly visible occupant restraint enforcement programs that focus on increasing the use of seat belts and child restraints.

H-97-7

The NTSB recommends that the U.S. Conference of Mayors, the National League of Cities, the National Association of Counties, and the National Association of Towns and Townships encourage and support efforts by enforcement organizations conduct dedicated and highly visible occupant restraint enforcement programs that focus on increasing the use of seat belt and child restraints.

H-97-9

The NTSB recommends that the members of the International Association of Chiefs of Police, the State Association of Chiefs of Police, and the National Sheriffs' Association conduct dedicated and highly visible occupant restraint enforcement programs that focus on increasing the use of seat belts and child restraints.

H-97-11

The NTSB recommends that NHTSA develop and implement a set of vehicle crash test standards using biologically representative child dummies and appropriate injury criteria.

H-97-16

The NTSB recommends that NHTSA develop, in conjunction with the States, uniform measurement procedures and tools for the States to use when conducting surveys on seat belt and child restraint use, and revise the 1992 guidelines to ensure that a probability-based design is use to select a representative sample of the population. Provide this information to the States.

H-97-23

The NTSB recommends that the Motion Picture Association of America, the Entertainment Industries Council, the Academy of Television Arts and Sciences, and the National Cartoonist Society encourage your members to show adults wearing seat belts properly and children in the back seat of passenger vehicles in size-appropriate child restraint systems unless obviously identified or depicted as high-risk behavior.

H-97-24

The NTSB recommends that the American Society of Newspaper Editors, the National Newspaper Association, and the Newspaper Association of America encourage your membership to report in news articles about passenger vehicle crashes, information on the use of seat belts and child restraints, and the injury severity that results when seat belts and child restraints are not used.

H-97-25

The NTSB recommends that the American Society of Newspaper Editors, the National Newspaper Association, and the Newspaper Association of America encourage your membership to require that advertisers show adults wearing seat belts properly and children in the back seat of passenger vehicles in size-appropriate child restraint systems.

H-97-26

The NTSB recommends that the DOT collect accident data involving school children riding on transit buses, including pedestrian accidents, to assist development of appropriate means to ensure that school children riding on transit buses are afforded an equivalent level of operational safety as school children riding on school buses.

H-97-27

The NTSB recommends that the DOT work with the National Association of State Directors of Pupil Transportation Services, the American Public Transit Association, and the Community Transportation Association of America to determine the most appropriate means to ensure that school children riding on transit buses in “tripper” service are afforded an equivalent level of operational safety as school children riding on school buses.

H-97-28

The NTSB recommends that the National Association of State Directors of Pupil Transportation Services (NASDPTS) work with the DOT, the American the Public Transit Association (APTA), and the Community Transportation Association of America (CTAA) to collect accident data involving school children riding on transit buses and determine the most appropriate means to ensure that school children riding on transit buses in "tripper" service are afforded an equivalent level of operational safety as school children riding on school buses.

H-97-29

The NTSB recommends that the APTA work with the DOT, the NASDPTS, and the CTAA to collect accident data involving school children riding on transit buses and determine the most appropriate means to ensure that school children riding on transit buses in "tripper" service are afforded an equivalent level of operational safety as school children riding on school buses.

H-97-30

The NTSB recommends that the CTAA work with the DOT, the NASDPTS, and the APTA to collect accident data involving school children riding on transit buses and determine the most appropriate means to ensure that school children riding on transit buses in "tripper" service are afforded an equivalent level of operational safety as school children riding on school buses.

H-99-1

The NTSB recommends that the governors of the States and territories and the mayor of the District of Columbia coordinate the establishment of multiple, permanent locations where child restraints can be properly installed in passenger vehicles and parents/caregivers can receive hands-on assistance in the proper use of child restraint systems by qualified or certified personnel.

H-99-2

The NTSB recommends that NHTSA develop incentive grant programs to assist in the funding of child restraint fitting stations.

H-99-3

The NTSB recommends that the domestic and international automobile manufacturers support the establishment and existence of child restraint fitting stations.

H-99-4

The NTSB recommends that the child restraint manufacturers support the establishment and existence of child restraint fitting stations.

H-99-20

The NTSB recommends that the U.S. Department of Health and Human Services (USDHHS) require that Head Start children be transported in vehicles built to Federal school bus structural standards or the equivalent.

H-99-21

The NTSB recommends that the USDHHS incorporate and mandate the use of the guidelines from NHTSA's guideline for the safe transportation of pre-school age children in school buses into the rules for the transportation of Head Start children.

H-99-22

The NTSB recommends that the States, U.S. Territories, and the District of Columbia require that all vehicles carrying more than 10 passengers (buses) and transporting children to and from school and school-related activities, including, but not limited to, Head Start programs and day care centers, meet the school bus structural standards or the equivalent as set forth in 49 CFR part 571. Enact regulatory measures to enforce compliance with the revised statutes.

H-99-23

The NTSB recommends that the States, U.S. Territories, and the District of Columbia review State and local laws and, if applicable, revise to eliminate any exclusions or exemptions pertaining to the use of age-appropriate restraints in all seat belt-equipped vehicles carrying more than 10 passengers (buses) and transporting school children.

H-99-24

The NTSB recommends that the States, U.S. Territories, and the District of Columbia adopt NHTSA's guideline for the safe transportation of pre-school age children in school buses, distribute the guideline to all school bus operators transporting preschool-age children to and from school or school-related activities, and encourage those operators to implement the guideline.

H-99-25

The NTSB recommends that these (numerous school and bus transportation) associations and churches inform their members about the circumstances of the accidents discussed in the 1999 special investigation report, *Pupil Transportation in Vehicles Not Meeting Federal School Bus Standards*, and urge that they use school buses or buses having equivalent occupant protection to school buses to transport children.

H-99-26

The NTSB recommends that the CTAA inform your members of the circumstances of the East Dublin, Georgia, accident and of the added safety benefits of transporting children by school bus, and encourage them to use buses built to federal school bus structural standards or equivalent to transport children. [1]

H-99-46

The NTSB recommends that NHTSA, once pertinent standards have been developed for school bus occupant protection systems, require newly manufactured school buses to have an occupant crash protection system that meets the newly developed performance standards and retains passengers, including those in child safety restraint systems, within the seating compartment throughout the accident sequence for all accident scenarios.

H-99-48

The NTSB recommends that NHTSA, once pertinent standards have been developed for motor coach occupant protection systems, require newly manufactured motor coaches to have an occupant crash protection system that meets the newly developed performance standards and retains passengers, including those in child safety restraint systems, within the seating compartment throughout the accident sequence for all accident scenarios.

M-93-1

The NTSB recommends that each State implement minimum recreational boating safety standards to reduce the number and severity of accidents; consider requirements such as mandatory use of PFDs for children, demonstration of operator knowledge of safe boating rules and skills, and operator licensing.

[1] In 1998, a passenger van, occupied by a driver, five children ages 4 and 5, and an adult aide, collided with a pickup truck. A 4-year-old child was ejected from the van and died. The van's driver was seriously injured, and the other van occupants received minor injuries. The pickup driver was killed.

For more information on Safety Board child safety initiatives, visit the Board's Web site: <http://www.ntsb.gov>.

National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594
www.ntsb.gov