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ABSTRACT

This document provides statistical information on the benefits of occupant restraint systems in U.S. motor vehicle accidents. Data tables include: (1) estimated number of lives saved by restraint systems (seat belts, air bags, child restraints), 1975-2001; (2) cumulative estimated number of lives saved by safety belt use, 1975-2001; and (3) cumulative estimated number of lives saved by child restraints, 1975-2001. According to the data, an estimated 147,246 lives were saved by safety belts from 1975 through 2001. If all passenger vehicle occupants over age 4 had worn safety belts, an additional 9,167 lives could have been saved in 2001. Similar benefits are evident from use of air bags and child restraints. (HTH)

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U.S. Department of Transportation
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Occupant Protection

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"Safety belts, when used, reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent."

Restraint Use Laws

The U.S. Department of Transportation's July 1984 rulemaking on automatic occupant protection began a wave of legislative action that resulted in the enactment of safety belt use laws in many states. The goal of those laws is to promote belt use and thereby reduce deaths and injuries in motor vehicle crashes.

The first mandatory belt use law was enacted in the State of New York in 1984. As of December 2001, 49 states and the District of Columbia had belt use laws in effect. The laws differ from state to state, according to the type and age of the vehicle, occupant seating position, etc.

In 32 of the states with belt use laws in 2001, the law specified secondary enforcement. That is, police officers are permitted to write a citation only after a vehicle is stopped for some other traffic infraction. Seventeen states and the District of Columbia had laws that allowed primary enforcement, enabling officers to stop vehicles and write citations whenever they observe violations of the belt law.

A 1995 NHTSA study, *Safety Belt Use Laws: An Evaluation of Primary Enforcement and Other Provisions*, indicates that states with primary enforcement safety belt laws achieved significantly higher belt use than did those with secondary enforcement laws. The analysis suggests that belt use among fatally injured occupants was at least 15 percent higher in states with primary enforcement laws.

The first mandatory child restraint use law was implemented in the State of Tennessee in 1978. Since 1985, all 50 states and the District of Columbia have had child restraint use laws in effect. These laws also cover various segments of the population.

Restraint System Effectiveness

Research has found that lap/shoulder safety belts, when used, reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent and the risk of moderate-to-critical injury by 50 percent. For light truck occupants, safety belts reduce the risk of fatal injury by 60 percent and moderate-to-critical injury by 65 percent.

Recent NHTSA analyses indicate an overall fatality-reducing effectiveness for air bags of 12 percent.

Research on the effectiveness of child safety seats has found them to reduce fatal injury by 71 percent for infants (less than 1 year old) and by 54 percent for toddlers (1-4 years old) in passenger cars. For infants and toddlers in light trucks, the corresponding reductions are 58 percent and 59 percent, respectively.

Table 1. Estimated Number of Lives Saved by Restraint Systems, 1975-2001

Restraint Type	1975-93	1994	1995	1996	1997	1998	1999	2000	2001
Seat Belts	60,838	9,206	9,790	10,414	10,750	11,018	11,197	11,889	12,144
Air Bags	389	276	470	686	842	1,043	1,263	1,584	1,816
Child Restraints	2,630	308	279	365	312	299	307	316	269

Benefits of Safety Belt Use

Starting in 1994, NHTSA revised its method for calculating lives saved by safety belts. The note at the bottom of this page explains the new method. The estimates in Table 1 and Figure 1 reflect this revision.

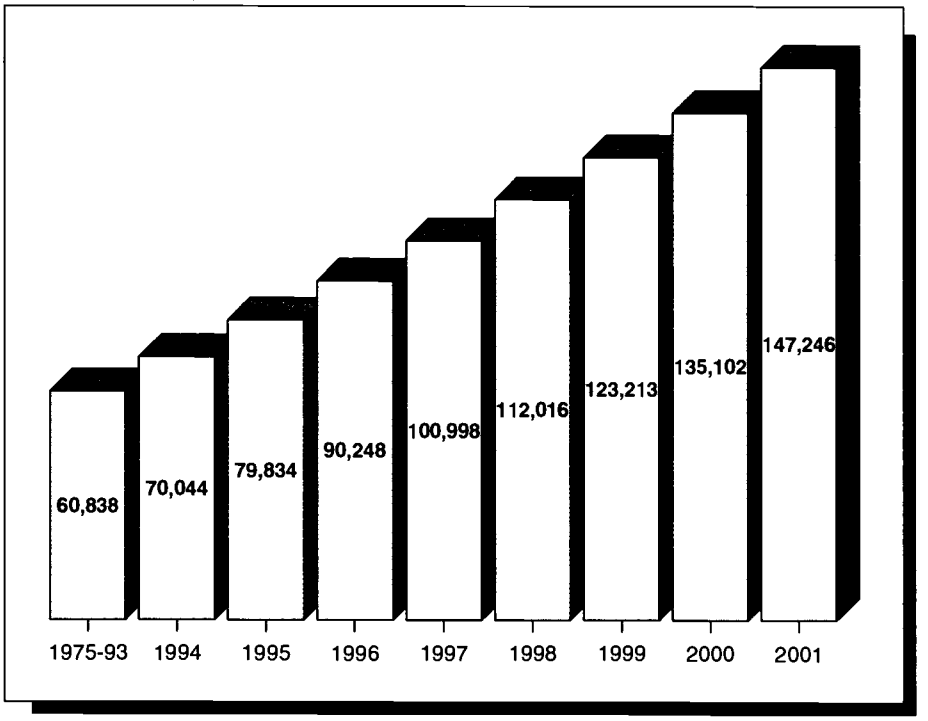
In 2001, 31,910 occupants of passenger vehicles (cars, light trucks, vans, and utility vehicles) were killed in motor vehicle traffic crashes, 76 percent of the 42,116 traffic fatalities reported for the year.

"From 1975 through 2001, an estimated 147,246 lives were saved by safety belts."

Among passenger vehicle occupants over 4 years old, safety belts saved an estimated 12,144 lives in 2001.

At the high use rates achieved in other countries (85 percent), safety belts could have saved the lives of 16,754 passenger vehicle occupants over age 4 (that is, an additional 4,610) for the nation as a whole in 2001. If *ALL* passenger vehicle occupants over age 4 wore safety belts, 21,311 lives (that is, an additional 9,167) could have been saved in 2001.

Figure 1. Cumulative Estimated Number of Lives Saved by Safety Belt Use, 1975-2001



In 1994, NHTSA revised its method of estimating lives saved by safety belts. The previous method incorporated survey data from states with and without belt use laws. The current method relies on police-reported restraint use information for each individual occupant fatality. In addition, the estimate now includes lives saved in passenger vehicles at *ALL* seating positions, where previously it had been front outboard positions only. Both methods address only occupants age 5 years and older; younger occupants should be restrained by child safety seats or booster seats, as appropriate.

The 1996 NHTSA study, *Crash Outcome Data Evaluation System (CODES)*, linked traffic and medical records in seven states to assess total costs of injury from motor vehicle crashes. The study found that the average inpatient costs for crash victims who were not using safety belts were 55 percent higher than for those who were belted.

Ejection from the vehicle is one of the most injurious events that can happen to a person in a crash. In fatal crashes in 2001, 75 percent of passenger car occupants who were totally ejected from the vehicle were killed. Safety belts are effective in preventing total ejections: only 1 percent of the occupants reported to have been using restraints were totally ejected, compared with 24 percent of the unrestrained occupants.

Air Bags

In 1995, NHTSA revised its method for calculating lives saved by air bags. The estimates in Table 1 reflect this revision.

"Between 1987 and 2001, 8,369 lives were saved by air bags."

Air bags, combined with lap/shoulder safety belts, offer the most effective safety protection available today for passenger vehicle occupants.

It is estimated that, as of 2001, more than 120 million air-bag-equipped passenger vehicles were on the road, including 96 million with dual air bags.

In 2001, an estimated 1,816 lives were saved by air bags. From 1987 to 2001, a total of 8,369 lives were saved.

Beginning September 1997 (model year 1998), all new passenger cars were required to have driver and passenger air bags, along with manual lap/shoulder safety belts. The same requirement applies to light trucks beginning in September 1998.

Air bags are *supplemental* protection and are not designed to deploy in all crashes. Most are designed to inflate in a moderate-to-severe *frontal* crash.

Some crashes at lower speeds may result in injuries, but generally not the serious injuries that air bags are designed to prevent. For this and other reasons, **lap/shoulder belts should always be used, even in a vehicle with an air bag.**

Children in rear-facing child seats should not be placed in the front seat of vehicles equipped with passenger-side air bags. The impact of a deploying air bag striking a rear-facing child seat could result in injury to the child.

Benefits of Child Restraint Use

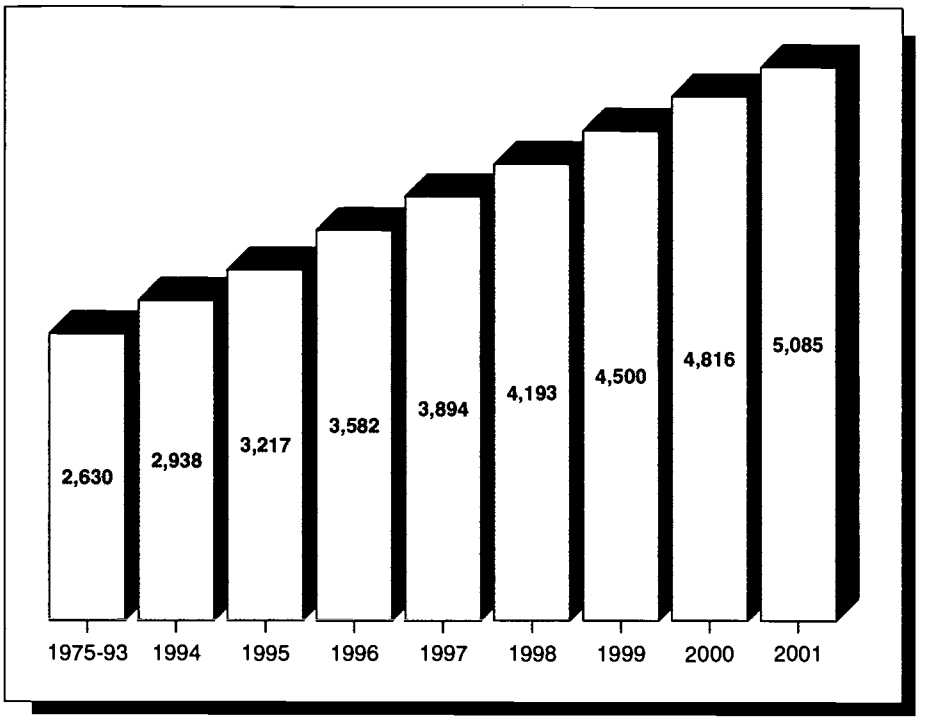
In 2001, there were 497 passenger vehicle occupant fatalities among children under 5 years of age. Of these 497 fatalities, an estimated 242 (or 49 percent) were totally unrestrained.

Among children under 5 years old, an estimated 269 lives were saved in 2001 by child restraint use. Of these 269 lives saved, 235 were associated with the use of child safety seats and 34 with the use of adult belts.

At 100 percent child safety seat use for children under 5, an estimated 407 lives (that is, an additional 138) could have been saved in 2001.

Over the period 1975 through 2001, an estimated 5,085 lives were saved by child restraints.

Figure 2. Cumulative Estimated Number of Lives Saved by Child Restraints, 1975-2001



"From 1975 through 2001, an estimated 5,085 lives were saved by child restraints."

Restraint Use

In 2002, NHTSA conducted the National Occupant Protection Use Survey (NOPUS). The overall observed shoulder belt use rate was 75 percent, compared to 71 percent observed in 2000, 69 percent in 1998, 61 percent in 1996, and 58 percent in 1994.

The reported restraint use rate among all occupants of passenger cars involved in fatal crashes was 61 percent in 2001. The use rate for drivers was higher (64 percent), and the highest use rate was reported for children age 4 and under (74 percent).

For more information:

Information on occupant protection is available from the National Center for Statistics and Analysis, NPO-121, 400 Seventh Street, S.W., Washington, D.C. 20590. NCSA information can also be obtained by telephone or by fax-on-demand at 1-800-934-8517. FAX messages should be sent to (202) 366-7078. General information on highway traffic safety can be accessed by Internet users at http://www-nrd.nhtsa.dot.gov/people/ncsa. To report a safety-related problem or to inquire about motor vehicle safety information, contact the Auto Safety Hotline at 1-800-424-9393.

Other fact sheets available from the National Center for Statistics and Analysis are *Overview, Alcohol, Older Population, Speeding, Children, Young Drivers, Pedestrians, Pedalcyclists, Motorcycles, Large Trucks, School Transportation-Related Crashes, State Traffic Data,* and *State Alcohol Estimates.* Detailed data on motor vehicle traffic crashes are published annually in *Traffic Safety Facts: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System.*

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