



# Occupant Protection

Seat belt use in 2011 was 84 percent, down slightly from 85 percent in 2010. This is still a huge increase from 75 percent in 2002 and 58 percent in 1994. This result is from the National Occupant Protection Use Survey (NOPUS), which is the only survey that provides nationwide probability-based observed data on seat belt use in the United States (DOT HS 811 651, August 2012).

In 2011, 21,253 occupants of passenger vehicles (passenger cars, pickup trucks, vans, and SUVs) died in motor vehicle traffic crashes. Of the 21,253 total occupants killed, 9,439 were restrained. Restraint use was not known for 1,634 occupants. Looking at only occupants where the restraint status was known 52% were unrestrained at the time of the crash.

The proportion of unrestrained passenger vehicle occupants killed in motor vehicle traffic crashes has decreased from 2002 to 2011. Among passenger vehicle occupants killed, when restraint use was known, the percentage of unrestrained deaths decreased by 7 percentage points from 59 percent in 2002 to 52 percent in 2011 (Table 1).

*In 2011, 64 percent of the passenger vehicle occupants ages 21 to 24 killed in traffic crashes were not using restraints — the highest percentage out of all age groups.*

Table 1  
**Passenger Vehicle Occupant Fatalities in Crashes by Restraint Use, 2002–2011**

Year	Restraint Use						Total		Percent Known Restrained	Percent Known Unrestrained
	Restrained		Unrestrained		Unknown					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent		
2002	12,533	38%	17,797	54%	2,513	8%	32,843	100%	41%	59%
2003	12,967	40%	16,764	52%	2,540	8%	32,271	100%	44%	56%
2004	13,250	42%	16,432	52%	2,184	7%	31,866	100%	45%	55%
2005	13,064	41%	16,247	51%	2,238	7%	31,549	100%	45%	55%
2006	12,710	41%	15,635	51%	2,341	8%	30,686	100%	45%	55%
2007	12,322	42%	14,446	50%	2,304	8%	29,072	100%	46%	54%
2008	10,691	42%	12,925	51%	1,846	7%	25,462	100%	45%	55%
2009	10,190	43%	11,545	49%	1,712	7%	23,447	100%	47%	53%
2010	9,969	45%	10,590	48%	1,714	8%	22,273	100%	48%	52%
2011	9,439	44%	10,180	48%	1,634	8%	21,253	100%	48%	52%

## Age, Gender, Seating Position, and Restraint Use

Among passenger vehicle occupant fatalities where restraint use was known, the age group 21 to 24 had the highest percentage of unrestrained occupants killed: 2,172 fatalities, of which 1,385 (64%) were unrestrained. The second highest percentage of unrestrained passenger vehicle occupant fatalities was 63 percent among the 25- to 34-year-olds (Table 2).

Table 2

### Passenger Vehicle Occupants Killed, by Age, Gender, Seating Position, and Restraint Use, 2011

	Restrained		Unrestrained		Unknown		Total		Percent Known Restrained	Percent Known Unrestrained
	Number	Percent	Number	Percent	Number	Percent	Number	Percent		
<b>Age (Years)</b>										
<4	142	66	59	27	15	7	216	100	71	29
4-7	121	62	61	31	12	6	194	100	66	34
8-12	124	50	102	41	20	8	246	100	55	45
13-15	87	33	159	60	17	6	263	100	35	65
16-20	1,028	37	1,536	55	233	8	2,797	100	40	60
21-24	787	33	1,385	58	214	9	2,386	100	36	64
25-34	1,247	34	2,159	58	291	8	3,697	100	37	63
35-44	993	39	1,372	53	202	8	2,567	100	42	58
45-54	1,147	42	1,359	50	195	7	2,701	100	46	54
55-64	1,164	53	876	40	148	7	2,188	100	57	43
65-74	1,041	60	559	32	122	7	1,722	100	65	35
75+	1,548	69	543	24	157	7	2,248	100	74	26
Unknown	10	36	10	36	8	29	28	100	50	50
<b>Total</b>	<b>9,439</b>	<b>44</b>	<b>10,180</b>	<b>48</b>	<b>1,634</b>	<b>8</b>	<b>21,253</b>	<b>100</b>	<b>48</b>	<b>52</b>
<b>Gender</b>										
Male	5,484	40	7,188	52	1,139	8	13,811	100	43	57
Female	3,954	53	2,989	40	492	7	7,435	100	57	43
Unknown	1	14	3	43	3	43	7	100	25	75
<b>Total</b>	<b>9,439</b>	<b>44</b>	<b>10,180</b>	<b>48</b>	<b>1,634</b>	<b>8</b>	<b>21,253</b>	<b>100</b>	<b>48</b>	<b>52</b>
<b>Seating Position</b>										
<b>Front Seat</b>										
Left	7,000	45	7,309	47	1,145	7	15,454	100	49	51
Middle	11	21	33	63	8	15	52	100	25	75
Right	1,757	50	1,526	43	252	7	3,535	100	54	46
Other/Unknown	0	0	7	64	4	36	11	100	0	100
<b>Total</b>	<b>8,768</b>	<b>46</b>	<b>8,875</b>	<b>47</b>	<b>1,409</b>	<b>7</b>	<b>19,052</b>	<b>100</b>	<b>50</b>	<b>50</b>
<b>Second Seat</b>										
Left	257	38	353	52	64	9	674	100	42	58
Middle	70	30	146	63	17	7	233	100	32	68
Right	300	36	458	56	67	8	825	100	40	60
Other/Unknown	3	11	20	74	4	15	27	100	13	87
<b>Total</b>	<b>630</b>	<b>36</b>	<b>977</b>	<b>56</b>	<b>152</b>	<b>9</b>	<b>1,759</b>	<b>100</b>	<b>39</b>	<b>61</b>
Other	28	11	212	80	25	9	265	100	12	88
Unknown	13	7	116	66	48	27	177	100	10	90
<b>Total</b>	<b>9,439</b>	<b>44</b>	<b>10,180</b>	<b>48</b>	<b>1,634</b>	<b>8</b>	<b>21,253</b>	<b>100</b>	<b>48</b>	<b>52</b>

In 2011, there were a total of 216 passenger vehicle occupant fatalities among children under age 4. Among the 201 fatalities in this age group for which restraint use was known, 59 (29%) were unrestrained. In the age group of 4 to 7, there were a total of 194 fatalities. Among the 182 fatalities in this age group for which restraint use was known, 61 (34%) were unrestrained.

Among males, there were a total of 13,811 passenger vehicle occupant fatalities. Of the 12,672 fatalities among males for which restraint use was known, 7,188 (57%) were unrestrained. Of the 7,435 fatalities among females, restraint use was known for 6,943, of which 2,989 (43%) were unrestrained.

The proportion of unrestrained passenger vehicle occupants who were seated in the front seat was 50 percent. The proportion of unrestrained passengers was higher (61%) for second row seats.

## Vehicle Type and Restraint Use

A total of 15,450 passenger vehicle drivers were killed in traffic crashes in 2011. Among the 14,304 driver fatalities for which restraint use was known, 51 percent (7,308) were unrestrained. Furthermore, 64 percent (1,995) of the drivers of pickup trucks killed were unrestrained, compared to 57 percent (1,399) for SUVs, 43 percent (285) for vans, and 45 percent (3,618) for passenger cars (Table 3).

Table 3

### Drivers and Passengers Killed, by Passenger Vehicle Type and Restraint Use, 2011

Type of Passenger Vehicle	Restraint Used		Restraint Not Used		Restraint Use Unknown		Total		Percent "Known" Restrained	Percent "Known" Unrestrained
	Number	Percent	Number	Percent	Number	Percent	Number	Percent		
<b>Drivers Killed</b>										
Passenger Cars	4,429	51	3,618	41	675	8	8,722	100	55	45
Pickup Trucks	1,124	34	1,995	60	226	7	3,345	100	36	64
Sport Utility Vehicles	1,068	40	1,399	53	183	7	2,650	100	43	57
Vans	374	52	285	40	61	8	720	100	57	43
Other Light Trucks	1	8	11	85	1	8	13	100	8	92
<b>Total</b>	<b>6,996</b>	<b>45</b>	<b>7,308</b>	<b>47</b>	<b>1,146</b>	<b>7</b>	<b>15,450</b>	<b>100</b>	<b>49</b>	<b>51</b>
<b>Passengers Killed</b>										
Passenger Cars	1,575	48	1,396	43	288	9	3,259	100	53	47
Pickup Trucks	273	30	574	63	64	7	911	100	32	68
Sport Utility Vehicles	427	35	692	57	102	8	1,221	100	38	62
Vans	166	41	208	51	34	8	408	100	44	56
Other Light Trucks	2	50	2	50	0	0	4	100	50	50
<b>Total</b>	<b>2,443</b>	<b>42</b>	<b>2,872</b>	<b>49</b>	<b>488</b>	<b>8</b>	<b>5,803</b>	<b>100</b>	<b>46</b>	<b>54</b>

A total of 5,803 passengers were killed in passenger vehicles in 2011. Among the 5,315 passenger fatalities for which restraint use was known, 54 percent (2,872) were unrestrained. Furthermore, among the passenger fatalities 68 percent of the passengers in pickup trucks were unrestrained, compared to 62 percent for SUVs, 56 percent for vans, and 47 percent for passenger cars.

*Seat belts, when used, reduce the risk of fatal injury to front-seat passenger car occupants by 45 percent and light-truck occupants by 60 percent.*

*In 2011, seat belts saved an estimated 11,949 lives among passenger vehicle occupants age 5 and older.*

*From 1975 through 2011, an estimated 9,874 lives were saved by child restraints.*

## **Seat Belt Use and Benefits**

Research has found that lap/shoulder seat 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, seat belts reduce the risk of fatal injury by 60 percent and moderate-to-critical injury by 65 percent.

Ejection from the vehicle is one of the most injurious events that can happen to a person in a crash. In fatal crashes in 2011, 77 percent of passenger vehicle occupants who were totally ejected from the vehicle were killed. Seat belts are effective in preventing total ejections; only 1 percent of the occupants reported to have been using restraints were totally ejected, compared with 31 percent of the unrestrained occupants.

## **Lives Saved by Seat Belts**

Among passenger vehicle occupants age 5 and older, seat belts saved an estimated 11,949 lives in 2011. If all passenger vehicle occupants age 5 and older had worn seat belts, 15,333 lives (that is, an additional 3,384) could have been saved in 2011 (Table 4).

## **Child Restraint Use and Benefits**

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

## **Lives Saved by Child Safety Seats**

Among children under age 5, an estimated 263 lives were saved in 2011 by restraint use. Of these 263 lives saved, 245 were associated with the use of child safety seats and 18 with the use of adult seat belts.

At 100-percent child safety seat use for children under age 5, an estimated 314 (that is, an additional 51) lives could have been saved in 2011.

## Frontal Air Bag Use and Benefits

Frontal air bags, combined with lap/shoulder belts, offer effective safety protection for passenger vehicle occupants. NHTSA analyses indicate a fatality-reducing effectiveness for frontal air bags of 14 percent when no seat belt was used and 11 percent when a seat belt was used in conjunction with frontal air bags.

It is estimated that as of 2011, 194 million air-bag-equipped passenger vehicles were on the road, including 187 million with dual air bags. 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. Lap/shoulder belts should always be used, even in vehicles with air bags.

*Children in rear-facing child safety 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 safety seat could result in serious injury to the child.*

*Frontal air bags, combined with lap/shoulder belts, offer effective safety protection for passenger vehicle occupants.*

## Lives Saved by Frontal Air Bags

In 2011, an estimated 2,204 lives were saved by frontal air bags. From 1987 to 2011, a total of 34,757 lives were saved (Table 4).

Table 4

### Estimated Number of Lives Saved by Restraint Systems, 1975–2011

Restraint Type	1975–01	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Seat Belts	150,589	14,264	15,095	15,548	15,688	15,458	15,223	13,312	12,763	12,582	11,949	292,471
Child Restraints	6,191	383	447	455	424	427	388	286	307	303	263	9,874
Frontal Air Bags	9,415*	2,324	2,519	2,660	2,752	2,824	2,800	2,557	2,387	2,315	2,204	34,757

\*Note: Total from 1987–2001. Frontal air bags did not exist prior to 1987.

Seat belt use rates in the States, the District of Columbia, and Puerto Rico in 2011 are shown in the last column in Table 5. The results were obtained by observing traffic on roads at selected sites. For more information on seat belt use rates, see the Crash\*Stat titled Seat Belt Use in 2011—Use Rates in the States and Territories (DOT HS 811 651).

*Between 1987 and 2011, 34,757 lives were saved by frontal air bags.*

Table 5

**Passenger Vehicle Occupants Killed by State, Restraint Use, and Observed Seat Belt Use Rate by State, 2011**

State	Restraint Use						Total Occupants Killed		Observed Seat Belt Use Rate*
	Restraint Used		No Restraint Used		Restraint Use Unknown				
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Alabama	269	39	382	56	31	5	682	100	88.0%
Alaska	14	30	26	55	7	15	47	100	89.3%
Arizona	166	39	219	51	46	11	431	100	82.9%
Arkansas	150	37	220	55	31	8	401	100	78.4%
California	921	60	523	34	102	7	1,546	100	96.6%
Colorado	112	37	185	62	3	1	300	100	82.1%
Connecticut	57	40	55	38	32	22	144	100	88.4%
Delaware	27	44	33	54	1	2	61	100	90.3%
Dist of Columbia	4	31	6	46	3	23	13	100	95.2%
Florida	568	46	608	49	64	5	1,240	100	88.1%
Georgia	389	44	421	48	67	8	877	100	93.0%
Hawaii	15	38	14	35	11	28	40	100	96.0%
Idaho	46	37	72	57	8	6	126	100	79.1%
Illinois	268	46	268	46	41	7	577	100	92.9%
Indiana	252	49	192	37	72	14	516	100	93.2%
Iowa	113	43	120	45	32	12	265	100	93.5%
Kansas	125	41	159	52	21	7	305	100	82.9%
Kentucky	235	43	306	56	3	1	544	100	82.2%
Louisiana	169	36	269	57	32	7	470	100	77.7%
Maine	47	46	51	50	4	4	102	100	81.6%
Maryland	135	47	139	48	13	5	287	100	94.2%
Massachusetts	71	31	108	47	50	22	229	100	73.2%
Michigan	315	55	193	34	68	12	576	100	94.5%
Minnesota	128	48	106	40	31	12	265	100	92.7%
Mississippi	192	38	309	62	0	0	501	100	81.9%
Missouri	176	30	370	62	49	8	595	100	79.0%
Montana	51	31	109	66	4	2	164	100	76.9%
Nebraska	43	30	79	56	19	13	141	100	84.2%
Nevada	54	39	64	47	19	14	137	100	94.1%
New Hampshire	13	20	53	80	0	0	66	100	75.0%
New Jersey	199	56	152	43	6	2	357	100	94.5%
New Mexico	129	54	109	45	2	1	240	100	90.5%
New York	343	57	185	31	74	12	602	100	90.5%
North Carolina	418	50	379	45	36	4	833	100	89.5%
North Dakota	30	26	76	67	8	7	114	100	76.7%
Ohio	267	39	357	52	68	10	692	100	84.1%
Oklahoma	201	39	287	56	23	5	511	100	85.9%
Oregon	126	59	62	29	27	13	215	100	96.6%
Pennsylvania	265	30	496	57	108	12	869	100	83.8%
Rhode Island	13	35	22	59	2	5	37	100	80.4%
South Carolina	248	45	258	47	41	7	547	100	86.0%
South Dakota	21	25	52	61	12	14	85	100	73.4%
Tennessee	284	40	372	52	54	8	710	100	87.4%
Texas	979	49	830	42	171	9	1,980	100	93.7%
Utah	73	44	78	47	15	9	166	100	89.2%
Vermont	24	57	17	40	1	2	42	100	84.7%
Virginia	247	45	301	54	6	1	554	100	81.8%
Washington	157	54	103	35	31	11	291	100	97.5%
West Virginia	85	32	132	50	45	17	262	100	84.9%
Wisconsin	170	43	189	48	37	9	396	100	79.0%
Wyoming	35	35	63	62	3	3	101	100	82.6%
<b>U.S. Total</b>	<b>9,439</b>	<b>44</b>	<b>10,179</b>	<b>48</b>	<b>1,634</b>	<b>8</b>	<b>21,252</b>	<b>100</b>	<b>84.0%</b>
Puerto Rico	64	36	115	64	0	0	179	100	91.9%

Grey shaded: States with primary seat belt laws in 2011. \*Crash\*Stats (DOT HS 811 651) dated August 2012



## 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 seat 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. Adult belt use laws are now in effect in 49 States, the District of Columbia, and Puerto Rico. The laws differ from State to State, according to the type and age of the vehicle, occupant seating position, etc.

In 17 of the States with belt use laws, the law specifies secondary enforcement. That is, police officers are permitted to write a citation only after a vehicle is stopped for some other traffic infraction. Thirty-two States, the District of Columbia, and Puerto Rico have laws that allow primary enforcement, enabling officers to stop vehicles and write citations whenever they observe violations of the seat belt law.

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.

A 2008 NHTSA research note, *States With Primary Enforcement Laws Have Lower Fatality Rates (Updated)*, indicated that States with primary enforcement seat 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 13 percentage points higher in States with primary enforcement laws.

### For more information:

Information on traffic fatalities is available from the National Center for Statistics and Analysis (NCSA), NVS-424, 1200 New Jersey Avenue SE., Washington, DC 20590. NCSA can be contacted at 800-934-8517 or via the following e-mail address: [ncsaweb@dot.gov](mailto:ncsaweb@dot.gov). General information on highway traffic safety can be accessed by Internet users at [www.nhtsa.gov/NCSA](http://www.nhtsa.gov/NCSA). To report a safety-related problem or to inquire about motor vehicle safety information, contact the Vehicle Safety Hotline at 888-327-4236.

Other fact sheets available from the National Center for Statistics and Analysis are *Alcohol-Impaired Driving*, *Bicyclists and Other Cyclists*, *Children*, *Large Trucks*, *Motorcycles*, *Older Population*, *Overview*, *Passenger Vehicles*, *Pedestrians*, *Race and Ethnicity*, *Rural/Urban Comparisons*, *School Transportation-Related Crashes*, *Speeding*, *State Alcohol Estimates*, *State Traffic Data*, and *Young Drivers*. 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*. The fact sheets and annual Traffic Safety Facts report can be accessed online at [www-nrd.nhtsa.dot.gov/CATS/index.aspx](http://www-nrd.nhtsa.dot.gov/CATS/index.aspx).



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