

# STATUS REPORT

INSURANCE INSTITUTE  
FOR HIGHWAY SAFETY

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## 4th of July is the day with the most crash deaths

School's out, the office is closed, and more people than usual take to the roads. So it's not surprising that holidays dominate the list of days when the most motor vehicle crash deaths



## MOTOR VEHICLE CRASH DEATHS, 1986-2002

### BY MONTH

	deaths	average per day	miles traveled (billions)	deaths per billion miles
January	51,694	98	2,996	17.3
February	47,247	98	2,860	16.5
March	54,645	104	3,328	16.4
April	55,710	109	3,328	16.7
May	62,426	118	3,534	17.7
June	64,152	126	3,526	18.2
July	68,099	129	3,658	18.6
August	69,731	132	3,677	19.0
September	63,965	125	3,366	19.0
October	66,553	126	3,477	19.1
November	61,145	120	3,237	18.9
December	62,071	118	3,258	19.1

### BY HOUR

	average per hour
midnight to 1 a.m.	5.4
1 a.m. to 2 a.m.	5.5
2 a.m. to 3 a.m.	5.3
3 a.m. to 4 a.m.	3.4
4 a.m. to 5 a.m.	2.6
5 a.m. to 6 a.m.	2.8
6 a.m. to 7 a.m.	3.6
7 a.m. to 8 a.m.	3.7
8 a.m. to 9 a.m.	3.2
9 a.m. to 10 a.m.	3.2
10 a.m. to 11 a.m.	3.6
11 a.m. to noon	4.0
Noon to 1 p.m.	4.4
1 p.m. to 2 p.m.	4.8
2 p.m. to 3 p.m.	5.5
3 p.m. to 4 p.m.	6.3
4 p.m. to 5 p.m.	6.3
5 p.m. to 6 p.m.	6.6
6 p.m. to 7 p.m.	6.6
7 p.m. to 8 p.m.	6.0
8 p.m. to 9 p.m.	5.9
9 p.m. to 10 p.m.	6.0
10 p.m. to 11 p.m.	5.8
11 p.m. to midnight	5.8



### BY DAY

	average per day
Sunday	132
Monday	98
Tuesday	95
Wednesday	98
Thursday	105
Friday	133
Saturday	158

Highest single-day count: 252 on 8/9/1986  
 Lowest single-day count: 45 on 3/2/1992

occur. What's interesting is how the pattern of deaths varies throughout the year.

"It's important to note that, while more deaths do occur on some of the holidays, the toll of fatalities is relentless every day, all year long," says Allan Williams, the Institute's chief scientist. The average during the 17 years from 1986 through 2002 was 117 deaths per day.

As Americans celebrate independence on the 4th of July each year, an average of 161 people die in motor vehicle crashes. This is 12 more deaths than the average on any other single day of the year and about 40 percent more crash deaths than occur on an average day.

The second worst day for crash deaths during the 17-year span was July 3. July 2 also was among the list of 10 days with the most deaths.

Institute researchers analyzed data from the federal Fatality Analysis Reporting System, an annual census of fatal crashes on U.S. roads. The motor vehicle deaths were sorted by month, day, and hour. The period

### DAYS OF YEAR WITH MOST CRASH DEATHS, 1986-2002

	total deaths	average per day
July 4	2,743	161
July 3	2,534	149
December 23	2,470	145
August 3	2,413	142
January 1	2,411	142
August 6	2,387	140
August 4	2,365	139
August 12	2,359	139
July 2	2,340	138
September 2	2,336	137

1986-2002 was chosen to balance the effects of travel on the weekends. Researchers also gathered information on the characteristics of the people and vehicles involved in the fatal crashes.

Six of the 10 days with the most deaths were holidays or near holidays. Besides the high toll on July 2-4, there was December 23, January 1, and September 2. The other four days on the "worst" list were in August.

**Deaths by month, day, and hour:** More miles are traveled in August than any other month, and August averaged the most crash deaths per day at 132. However, October and December averaged the highest death rate per billion miles traveled (19.1). January and February averaged the lowest number of vehicle miles traveled and deaths per day (98).

The day of week with the lowest average fatality count was Tuesday (95 deaths), followed by Mondays and Wednesdays. Far more deaths (158) occurred on Saturdays.

More of the deaths occurred during the afternoon and evening, peaking from 5 to 7 p.m. with an average of 6.6 deaths per hour. The fewest average number of deaths occurred between 4 and 6 a.m.

**Toll of crash deaths doesn't resonate:** "An average of 117 deaths per day is the equivalent of a major commercial airline disaster occurring every day of the 6,209 consecutive days of the 17-year span we analyzed," Williams points out. "But there's a big difference in how society approaches these losses. When a plane goes down it's big news and there's a concentrated effort to find ways to prevent future crashes. But the toll of highway deaths doesn't attract the same attention."

Fatal motor vehicle crashes don't resonate like airline crashes in part because, taken one at a time, they aren't as catastrophic. Ninety-four percent of the motor vehicle deaths during 1986-2002 occurred in crashes in which one or two people were killed.

"If newspapers printed headlines like '100 people died in crashes yesterday,' and these headlines ran every day, then the magnitude of this problem wouldn't be so obscured in the mind of the public," Williams says. However, nationwide tallies of deaths aren't available until months after the crashes occur.

**Deaths by type of crash:** About three of every four motor vehicle crash fatalities are occupants of passenger vehicles. Another 13 percent of the deaths are pedestrians, and 7 percent are motorcyclists. While July 4 was the day with the highest average number of passenger vehicle occupant and motor-



### CRASH DEATHS ON JULY 4, 2002

**Eighteen-year-old Danielle Mooney, driving a red Ford Escort (above), was trying to swat a bug that had flown in the window when her car hit a guardrail and rolled over, sliding down an embankment. Danielle died, but three other occupants including a toddler survived the crash near Elyria, Ohio. On the same day in Colorado, rider Gregg Haberland, 40, died when an oncoming car swerved into his lane and struck his motorcycle. A total of 144 people died in crashes on that day, July 4, 2002. An average of 161 people die in crashes every 4th of July.**



cyclist deaths during 1986-2002, January 1 and October 31 (Halloween) were when the most pedestrians were killed.

Alcohol is a factor in a greater proportion of crash deaths on both the 4th of July and New Year's Day. Forty-one percent of the deaths on the 4th and 51 percent on January 1 involved high blood alcohol concentrations. These proportions compare with 33 percent on December 25 and January 8 (days in close proximity that aren't associated with New Year's) and 31 percent on June 27 and July 11. On both July 4 and January 1, a higher percentage of the fatally injured pedestrians had high blood alcohol concentrations, compared with drivers of passenger vehicles in which occupant deaths occurred (43 percent versus 40 percent on July 4; 58 percent versus 50 percent on January 1).

"However you tally the deaths or sort them by contributing factors, the total of 727,438 human lives lost over 17 years represents a huge burden on the public health," Williams concludes.

For a copy of "Temporal factors in motor vehicle crash deaths" by C.M. Farmer and A.F. Williams, write: Publications, Insurance Institute for Highway Safety, 1005 N. Glebe Rd., Arlington, VA 22201, or email [publications@iihs.org](mailto:publications@iihs.org).



## What works and what doesn't to REDUCE PEDESTRIAN CRASHES

An Institute review of research on crashes involving pedestrians has identified several traffic engineering countermeasures. These can be effective in reducing the approximately 5,000 pedestrian deaths and more than 80,000 injuries that occur each year. About 40 percent of all crashes involving pedestrians occur at intersections.

"Safety officials need to know which options are the most effective for a particular situation," says Richard Retting, senior transportation engineer at the Institute. "What we've done is collect information on what works to reduce the problem, especially at intersections."

One of the simplest and least costly methods is to change signal light timing to give pedestrians exclusive access to intersections. A study has found that this reduces crashes by about half.

A variation known as early release signal timing gives pedestrians a head start across an intersection before the light changes for vehicle traffic (see *Status Report*, March 13, 1999; on the web at [www.iihs.org](http://www.iihs.org)). One study found this reduces conflicts between pedestrians and vehicles by about 95 percent.

### DAYS OF YEAR WITH MOST PEDESTRIAN CRASH DEATHS, 1986-2002

	total deaths	average per day
January 1	410	24
October 31	401	24
December 23	373	22
December 20	357	21
November 2	351	21
October 26	350	21
November 3	348	20
November 10	344	20
November 1	340	20
December 18	339	20





Another effective approach is to separate vehicles and pedestrians by space — for example, by adding refuge islands, which are raised medians between lanes of opposing traffic. They effectively reduce crashes at wide intersections or where elderly pedestrians cross frequently. A study found that adding such islands reduces pedestrian crash rates by about half at both marked and unmarked crossings. Another study found conflicts reduced by two-thirds.

Roundabouts have been shown to reduce vehicle-to-vehicle crashes when they replace traffic signals and stop signs (see *Status Report*, July 28, 2001; on the web at [www.iihs.org](http://www.iihs.org)). Two studies also have reported reductions in pedestrian crashes of about 75 percent after conversion to roundabouts.

“Re-engineering an intersection with a signal to a roundabout can be a major undertaking. It can be costly. But it can save money, too, if it means traffic moves more smoothly and there’s no need to add lanes to alleviate congestion,” Retting points out.

Enhancing roadway lighting is an obvious way to improve pedestrian visibility after dark. This is important because more than half of fatal pedestrian crashes occur at night. At crosswalks where the lighting intensity has been increased, two studies found that crashes decreased by more than half.

Other approaches have shown promise but haven’t been as thoroughly evaluated. Advance stop lines, flashing lights in the pavement, and automatic pedestrian detection are examples that merit further study.

Some methods have been ineffective in reducing collisions involving pedestrians. Adding crosswalk markings at locations without traffic signals doesn’t help. One study found that such markings make no difference on narrow, low-volume streets and are associated with higher crash rates on wider roads where more than 12,000 vehicles pass per day. Another study found an increase in crash risk among pedestrians 65 and older when they used marked crosswalks at intersections without traffic signals.

Traffic calming methods have been used with success to reduce vehicle speeds. Such measures include curbs protruding into lanes to make them narrower at crosswalks, speed humps, and islands between lanes (see *Status Report*, May 2, 1998; on the web at [www.iihs.org](http://www.iihs.org)). But these measures haven’t been shown to reduce pedestrian crash frequencies.

“It’s logical to assume that crash severity would be lessened where traffic calming has slowed vehicle speeds, but this hasn’t been addressed in the research,” Retting says. He adds that “priority among countermeasures should be given to the most effective ones. Traditional approaches without proven effectiveness or approaches that are inappropriate for a given situation will simply waste scarce resources instead of helping to protect pedestrians.”

For a copy of “A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes” by R.A. Retting et al., see *American Journal of Public Health* 93:9 (2003).

## Airbag switches often aren't switched on or off for best protection

*Sometimes airbags are turned on for young children, occasionally off for adults*

Drivers of pickups with on/off switches for the frontal airbags on the passenger side and with children ages 1 to 12 riding in the front seat are only turning the airbags off about half of the time. This



is the main finding of a survey by the National Highway Traffic Safety Administration (NHTSA).

Drivers with infants in rear-facing child restraints turned off the passenger airbags most frequently — about 86 percent of the time. On the other hand, passenger airbags were turned off for about 17 percent of the adult passengers surveyed, affording them no safety benefit from the airbags in the event of a crash.

NHTSA recommends turning off passenger airbags whenever a child 12 or younger rides in the front seat because of the risk of inflation injuries caused by the deploying airbags. Passenger airbags should be turned on whenever someone 13 or older rides in the front passenger seat.

As the number of child deaths from deploying airbags increased during the 1990s, NHTSA began in 1995 to allow automakers to install the switches for passenger airbags in vehicles that

wouldn't accommodate a rear-facing child restraint anywhere except in the front passenger seat. As a result, the manufacturers fitted on/off switches into pickup trucks with passenger airbags, beginning with some 1996 models and extending to nearly all models by 1998. Far fewer switches have been installed in other kinds of vehicles without back seats. Manufacturers are allowed to offer switches until 2012.

To find out how people are using the switches, researchers interviewed more than 3,000 drivers of pickup trucks in California, Georgia, Michigan, and Texas. A mix of urban and rural counties were included. The interviews, conducted in 2000, included more than 600 cases where at least one front-seat passenger was a child. Nearly all drivers indicated awareness that their vehicles were equipped with on/off switches, and nearly all (97 percent) knew what position the switch was in at the time of the interview. About two-thirds of the drivers who had used the switches and 35 percent of the drivers who hadn't volunteered that the primary purpose was to protect children.

Passenger airbags were left on about a quarter of the time when children 1 to 6 years old were riding in the front seat. The proportion of airbags left on climbed to as high as three-quarters of the time for children between 7 and 12 years old.

"Apparently some parents aren't familiar with the federal guidelines, or they're simply forgetting to turn the airbags off," says Susan Ferguson, the Institute's senior vice president for research. "Unfortunately, if you give people a choice, sometimes they make the wrong choice."

The airbags in future models will detect when a child is present in the front seat and either suppress deployment automatically or reduce the force of the inflation to lessen the potential for harm. These systems will eliminate the need for on/off switches. In the meantime, NHTSA plans to target drivers of pickups with a public information and education campaign on the correct use of switches.

For "Results of the survey on the use of passenger airbag on/off switches" (DOT HS 809 689) by C. Morgan, go to [www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809689](http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809689).



## In other highway safety news ...

**Stiffer penalties for higher BACs:** The majority of states have laws that impose more severe penalties for drivers with high blood alcohol concentrations (BACs), usually 0.15 or 0.20 percent or more. Minnesota's law, effective in 1998, defines a high BAC as 0.20 percent or more. Offenders face double the pre-conviction administrative license revocation term (180 days instead of 90), and jail time is mandatory. This is the only state to mandate administrative impoundment of offenders' license plates. A federal study has found that first-time high BAC offenders in Minnesota had significantly lower recidivism rates after a year than offenders with BACs of 0.17-0.19 percent who weren't subject to the more severe penalties. The large majority of high BAC offenders did, in fact, draw stiffer penalties. Breath test refusals didn't increase as some had feared. For details go to [www.nhtsa.dot.gov/people/injury/alcohol/EnhancedSanctions/pages/contents.html](http://www.nhtsa.dot.gov/people/injury/alcohol/EnhancedSanctions/pages/contents.html).

**Photo radar in Oregon:** The Supreme Court of Oregon has found that the state's photo enforcement of speed limits doesn't violate constitutional rights to due process. Tickets generated by photo radar systems are issued to the registered owners of vehicles, and the case involved the state's inference that a vehicle owner is driving at the time of a violation. The defendant claimed this presumption was unconstitutional, but the Court pointed out that the violation is civil, not criminal, so there's a lower burden of proof. The legislature "reasonably could select proof of ownership as the point at which the burden shifts to the registered owner to prove that he or she was not driving." Previous constitutional challenges to photo enforcement in other states also have been rejected (see *Status Report*, Feb. 7, 2004; on the web at [www.iihs.org](http://www.iihs.org)).

**Red light cameras in wide use:** More than 100 U.S. communities now operate red light camera enforcement programs, and the number is growing. Thirty communities including Philadelphia, Virginia Beach, and Providence authorized cameras in 2003. Chicago has announced a program of 40 red light cameras at 20 intersections by the end of 2004, putting this city on target to operate one of the largest programs in the country. Cameras decrease red light violations and intersection crashes, especially those involving injuries (See *Status Report*, May 4, 2002; on the web at [www.iihs.org](http://www.iihs.org)).

**Headlight glare:** Almost 200 complaints over the past 2 years have prompted the National Highway Traffic Safety Administration to move toward rulemaking that would address the issue of headlight glare. The agency has reviewed almost 5,000 comments solicited earlier and decided to address 6 aspects of the problem — mounting height, auxiliary lamps, technologies such as high intensity discharge and light emitting diodes, bulb specifications such as size and color, aiming, and adaptive frontal lighting. The notice of proposed rulemaking for mounting height is expected this summer, and the other notices are expected to follow.

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