

# Status Report

Insurance Institute for Highway Safety | Highway Loss Data Institute

## Unbelted

Adults admit they often skip belts in rear seat

- ▶ Lap/shoulder belt better than lap belt alone in rear middle seat
- ▶ Studies link marijuana legalization with rise in crashes
- ▶ Noise mandate for hybrids, electrics faces NHTSA delay

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THIS ISSUE**  
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**A**ddults have gotten the message that it's safer for kids to ride in the back seat properly restrained, but when it comes to their own safety, there is a common misperception that buckling up is optional. Among adults who admit to not always using safety belts in the back seat, 4 out of 5 surveyed by IIHS say short trips or traveling by taxi or ride-hailing service are times they don't bother to use the belt.

The new survey reveals that many rear-seat passengers don't think belts are necessary because they perceive the back seat to be safer than the front. This shows a clear misunderstanding about the importance of safety belts, no matter where a person sits in a vehicle.

Before the majority of Americans got into the habit of buckling up, the back seat was the safest place to sit, and the center rear seat was the safest place of all in 1960s-70s vehicles. In recent decades, high levels of restraint use and the advent of belt crash tensioners, airbags and crashworthy vehicle designs have narrowed the safety advantages of riding in the rear seat for teens and adults.

A study by IIHS and The Children's Hospital of Philadelphia published in *Accident Analysis and Prevention* in 2015 found no difference in the risk of dying in a crash when seated in the rear compared with the front seat for restrained occupants ages 13 to 54 in model 2000 and newer passenger vehicles (see *Status Report*, Dec. 23, 2014, at [iihs.org](http://iihs.org)). Belted occupants 55 and older, however, had a higher relative risk of death

**For most adults, it is still as safe to ride in the back seat as the front seat, but not if you aren't buckled up. That applies to riding in an Uber, Lyft or other hired vehicle, too. In the rear seat, a lap/shoulder belt is the primary means of protection in a crash. Unbelted passengers put themselves and other occupants at risk.**

when seated in the back than when seated in the front. Unrestrained rear-seat occupants were nearly 8 times as likely to sustain a serious injury in a crash as restrained rear-seat occupants.

"For most adults, it is still as safe to ride in the back seat as the front seat, but not if you aren't buckled up," says Jessica Jermakian, an IIHS senior research engineer and a co-author of the study. "That applies to riding



in an Uber, Lyft or other hired vehicle, too."

While driver and front-passenger belt use has been extensively studied, there is not a lot of research on why rear-seat passengers don't buckle up. Prior IIHS surveys of belt use among adults focused on their belt-use habits in general, but not specifically belt use in the rear seat. The latest study fills this gap.

IIHS surveyed adults 18 and older by cellphone and landline between June and

August 2016. Of the 1,172 respondents who said they had ridden in the back seat of a vehicle during the preceding six months, 72 percent said they always use their belt in the back seat, while 91 percent said they always use their belt when seated in front. This is in line with the 2015 nationwide observed belt use of 75 percent for adult rear-seat occupants and 89 percent for drivers and front-seat passengers.



**IHS surveyed adults who had ridden in the back seat of a personal or hired vehicle**

**Top reasons respondents cited for not always using belts in rear seat compared with front seat**

	percent
Safer in the back so I don't need it	25
Habit/forget/rarely wear it	13
Uncomfortable/doesn't fit	12
Difficult to use, find belts/buckles	10
Law doesn't require it	9

**Top reasons respondents cited for not always using belts in taxi, Uber or other hired vehicle**

Habit/forget/it's inconvenient	17
I don't know	17
Only going short distances/ at low speeds	15
Difficult to use, can't find buckle/belt	10

**"I would be more likely to wear my safety belt in the back if..."**

Someone in the car reminded me	75
If the driver could get pulled over because I'm not wearing my safety belt	73
There was an audible belt reminder	62
I knew there was a law	60
Shoulder belt was more comfortable	59
Lap belt was more comfortable	52
There was a visual belt reminder	50
Buckle was easier to find	49

Although safety belts are proven to save lives, more than half of the people who die in passenger vehicle crashes in the U.S. each year are unbelted.

One person's decision not to buckle up can have consequences for other people riding with them.

"People who don't use safety belts might think their neglect won't hurt anyone else. That's not the case," Jermakian says.

Drivers are about twice as likely to be fatally injured in crashes in which the left rear passenger was unrestrained compared with crashes in which the passenger was belted, a 2013 University of Virginia study found.

"In the rear seat a lap/shoulder belt is the primary means of protection in a frontal crash. Without it, bodies can hit hard surfaces or other people at full speed, leading to serious injuries," Jermakian says.



### Unbuckled occupants put themselves and others at risk in a crash

IIHS sled tests show why it is crucial to buckle up, even in back. IIHS engineers placed an unbelted dummy in the back seat behind the belted driver dummy. Without a safety belt to control its movement during the crash, the rear-seat dummy slammed into the back of the driver seat, sandwiching the driver dummy between the seat and front airbag. In a real crash like this, both the driver and passenger likely would be injured.

**Passengers say they would be more likely to buckle up in the back seat if the lap/shoulder belt were more comfortable. Softer or padded belts that can be adjusted so they don't rub the neck would help.**

#### Belt holdouts

Prime-age adults (35 to 54 year-olds) were the least likely group to report always buckling up in the back seat. Sixty-six percent of this group reported always using a belt in back, compared with 76 percent of adults 55 and older and 73 percent of adults 18 to 34.

Women were more likely than men to report always using a belt in the rear seat, and adults who had attended college were more likely to buckle up than adults with less education. These findings are in line with prior surveys of belt use.

When asked why they don't buckle up, a quarter of respondents in the group who reported buckling up less often in the back seat than in the front said they believe the rear seat is safer than the front, so using a belt isn't necessary. The next most popular reason this group gave was that using a belt isn't a habit or they forget about it or simply

never or rarely use it. Twelve percent of respondents cited uncomfortable or poorly fitting belts as a reason for not buckling up, and 10 percent said the belt is difficult to use or they can't find the belt or buckle.

People who said that most of their trips as a rear-seat passenger were in hired vehicles were more likely to report not always using their safety belt than passengers in personal vehicles. In the survey, 57 percent of passengers in hired vehicles reported always using their belt in the rear seat, compared with 74 percent of passengers in personal vehicles.

"If your cab or ride-hailing driver is involved in a crash, you want that safety belt," Jermakian says. "Even if state law says belts are optional, go ahead and buckle up anyway. If you can't find the belt or it's inaccessible, ask your driver for help."

#### Reminders, laws and comfort

Nearly two-thirds of part-time belt users and nonusers said audible rear-seat belt reminders would make them more likely to buckle up. IIHS studies have shown that driver belt use is higher and fatality rates

are lower in vehicles with enhanced belt reminders than in vehicles without them (see *Status Report*, Feb. 9, 2002, June 13, 2006, and March 6, 2012). Results of a 2012 IIHS survey show that most motorists support enhanced belt reminders that are more persistent and intense than most U.S. vehicles have now (see *Status Report*, Jan. 24, 2013).

Still, few vehicles have belt reminders for the rear seat. In 2015, only 3 percent of models sold in the U.S. had them, and the number hasn't increased appreciably in newer vehicles.

Nearly 40 percent of people surveyed said they sometimes don't buckle up in the rear seat because there is no law requiring it. If there were such a law, 60 percent of respondents said it would convince them to use belts in the back seat. A greater percentage said they would be more likely to buckle up if the driver could get pulled over because someone in the back wasn't buckled.

Except for New Hampshire, all states and the District of Columbia require adults in the front seat to use belts. All rear-seat passengers are covered by laws in 29 states and D.C. Of these laws, 20 carry primary



# Lap/shoulder belt better than lap belt alone in rear middle seat to reduce fatality risk

Using a lap/shoulder belt reduces the chances of dying in a crash by 58 percent for people seated in the center rear seat of cars and 75 percent for people buckled up in minivans, pickups and SUVs, a new National Highway Traffic Safety Administration (NHTSA) report indicates. Using a lap belt alone reduces the risk of a fatality, though not as much as a three-point belt.

The center rear seat was the last to get lap/shoulder belts among seating positions in passenger vehicles sold in the U.S. Also known as three-point belts, lap/shoulder belts were mandated in the outboard rear seats of cars starting in model year 1990, and in pickups, passenger vans, and SUVs starting in model year 1992. It wasn't until 2005 that lap/shoulder belts were required for the center rear seat, with a phase-in extending to September 2007. Until then, many manufacturers made do with lap belts in the center rear seat.

Chuck Kahane, a former NHTSA researcher, examined 1990 to 2014 crash data from the Fatality Analysis Reporting System (FARS) for model year 1990-2015 vehicles to estimate the effectiveness of safety belts and the relative risk of various seating positions. Kahane focused on teenage and adult occupants, not children.

Using lap belts alone reduced the risk of a fatality by 48 percent for occupants in the center rear seat of cars and by 73 percent for minivan, pickup, and SUV occupants, Kahane estimated.

For the outboard rear seat positions, using lap/shoulder belts reduced the risk of a fatality by 54 percent for car occupants and by 75 percent for occupants of minivans, pickups and



enforcement, meaning a police officer can stop a driver solely for a belt-law violation. The rest are secondary, so an officer must have another reason to stop a vehicle before citing an occupant for riding unbelted.

Aside from stronger belt laws, more than half of part-time belt users and nonusers said more comfortable belts would make them more likely to buckle up in the rear seat. They want softer or padded belts, plus shoulder belts that are adjustable so they don't rub the neck. Tight and locking belts are turnoffs for them. Participants cited a variety of comfort and usability issues, regardless of age or body size.

Safety belts saved 13,941 lives during 2015, the National Highway Traffic Safety Administration estimates. If everyone buckled up, an additional 2,800 deaths could have been prevented. For drivers and front passengers, using a lap and shoulder belt reduces the risk of fatal injury by 60 percent in a pickup, SUV or van and by 45 percent in a car.

For a copy of "Passenger use of and attitudes toward rear seat belts" by J. S. Jerma-kian and R. A. Weast, email [publications@iihs.org](mailto:publications@iihs.org). ■

SUVs. The estimates update a 1999 NHTSA report that found a 44 percent reduction in the risk of fatal injury for back-seat outboard occupants in cars and a 73 percent reduction in fatal injury risk for back-seat outboard occupants of vans and SUVs.

In the new study, side impacts accounted for a bigger proportion of deaths in cars than in minivans, pickups and SUVs, while minivans, pickups and SUVs saw more frontal impacts and rollovers than cars.

"Fatality reduction by seat belts in the center rear seat and comparison of occupants' relative fatality risk at various seating positions" by C.J. Kahane is available at <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812369>. ■



# Studies link legalized use of recreational marijuana with increase in crashes

**A** HLDI analysis released in June found a higher-than-expected frequency of collision claims reported to insurers in the first three states to permit recreational use of marijuana for adults. In a study published the same day as HLDI's release, researchers at the University of Texas at Austin found an increase in fatal crashes in two states with legalized recreational marijuana use, although the results weren't significant. Both studies provide evidence that loosening restrictions on marijuana use affects highway safety.

HLDI found a 3 percent increase in the frequency of collision claims in Colorado, Oregon and Washington associated with the advent of retail marijuana sales (see

*Status Report*, June 22, 2017, at [ihs.org](http://ihs.org)). HLDI also looked at loss results for each state individually compared with loss results for adjacent states without legalized recreational marijuana use prior to November 2016. Colorado, which was first to begin retail sales of recreational marijuana, saw the biggest estimated increase in claim frequency compared with its control states.

The UT Austin study published in the *American Journal of Public Health* looked at changes in fatal crashes in Colorado and Washington associated with the recreational use of marijuana between 2009-15. The authors conclude that, "Three years after recreational marijuana legalization, changes in motor vehicle crash fatality rates for Washington and Colorado were not statistically different from those in similar states without recreational marijuana legalization."

Not surprisingly, some journalists cast this study as conflicting with HLDI's analysis, but both yield similar estimates of the effect of legalizing recreational use of marijuana.

The UT Austin study found "approximately 77 excess crash fatalities (of 2,890 total)" coincident with legalizing recreational use of marijuana. This equates to a 2.7 percent increase, the same as HLDI's unrounded, statistically significant estimate. The UT Austin authors state that they do not view the increase in deaths as

"clinically significant" and do not indicate how many deaths need to occur before they would deem them clinically significant.

Claims reported to insurers contain many lower-speed crashes, while fatal crashes make up a small, severe subset of all crashes. More data are needed to determine whether the rise in fatalities is statistically significant. In the meantime, the UT Austin analysis suggests deaths will go up.

"Together, these studies are consistent and support the conclusion that crashes have increased in states that have legalized the recreational use of marijuana," says Adrian Lund, IIHS-HLDI president.

The methodologies, data sets, control states and time periods used in both studies differ. HLDI examined monthly collision claim frequencies per insured vehicle year to evaluate crash risk, while the UT Austin study used annual fatal crashes per billion miles traveled.

HLDI compared Colorado, Washington and Oregon among themselves and with neighboring Idaho, Nebraska, Nevada, Montana, Utah and Wyoming. Analysts chose the control states based on geographic contiguity (to control for weather or other regional differences), as well as having reasonably similar patterns of collision claim frequencies prior to marijuana legalization. The UT Austin authors primarily used



Southern/Southeastern states to control for Northwestern states, comparing Colorado and Washington with Alabama, Indiana, Kentucky, Missouri, South Carolina, Tennessee, Texas and Wisconsin.

“There is no reason, for example, to expect year-to-year weather changes to be similar in Washington as in Alabama,” Lund says. “The authors indicated that they wanted to have control states that had not legalized marijuana for medical or recreational use, and that could have restricted their choice of states. However, as long as the states don’t change their laws, that is an unnecessary constraint.”

The HLDI analysis began in January 2012, and the UT Austin study began in 2009. HLDI’s data spanned claims filed between January 2012 and October 2016. HLDI used the dates that retail sales of recreational marijuana began as intervention points: Colorado in January 2014, Washington in July 2014 and Oregon in October 2015. Monthly collision claim rates after those dates compared with earlier months were used to estimate the effect of recreational marijuana.

The UT Austin study used December 2012 for Colorado (when a person age 21 and older could legally possess small amounts of marijuana) and November 2012 for Washington (when voters approved the measure) as intervention dates. Annual fatality counts in 2013-15 compared with earlier years were used to estimate the effect of recreational marijuana.

“We think that the biggest changes in behavior would occur after citizens in the study states could walk into a store and buy marijuana. Thus, it is possible that the estimated effect of recreational marijuana use on fatal crashes may have been larger had the UT Austin study used the date when retail sales began, rather than the date when use became legal,” Lund says.

The HLDI results stand on their own.

“There has been an increase in collision claims in the first three states to legalize recreational marijuana that can’t be explained by regional variation, weather, years of exposure, the economy or changes in vehicle density,” Lund says.

“Crash fatality rates after recreational marijuana legalization in Washington and Colorado” by J.D. Aydelotte et al. appears in the August 2017 issue of the *American Journal of Public Health*. ■

# Noise mandate for hybrids, electric faces NHTSA delay

**A** regulation requiring normally quiet hybrid and electric vehicles to make noise at low speeds in order to warn pedestrians of their approach has been delayed.

The National Highway Traffic Safety Administration (NHTSA) announced the final rule in November 2016, and it was set to take effect in February (see *Status Report*, Feb. 1, 2017, at [ihs.org](http://ihs.org)). Since then, NHTSA has delayed the effective date several times. The latest postponement goes until Sept. 5.

NHTSA initially delayed the rule because of the Trump Administration’s Jan. 20 memo instructing agencies to postpone the effective dates of regulations that had been approved but hadn’t yet taken effect.

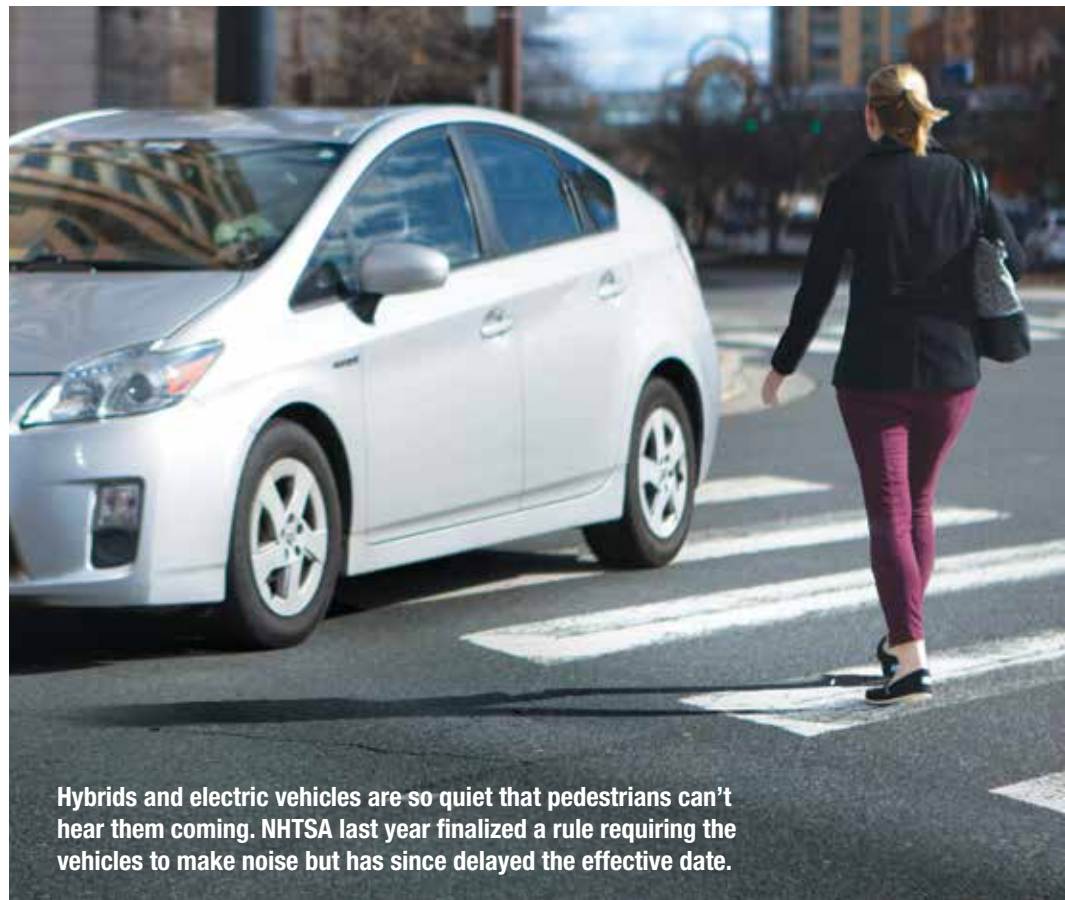
The agency says it also is taking time to respond to petitions from some automakers and industry groups, who are asking NHTSA to change the compliance deadline

from 2019 to 2020 and to clarify the rule’s technical requirements.

Electric motors are much quieter than internal combustion engines. Pedestrians and bicyclists can be at risk if they can’t hear a moving vehicle nearby. Advocates for the blind were the first to draw attention to the issue.

Under the new rule, hybrid and electric vehicles must emit an engine-like sound while moving forward or in reverse at speeds up to 19 mph. The rule also requires the noise from stationary vehicles if they aren’t in park.

IIHS supported the requirement. A 2011 HLDI analysis found that hybrids were about 20 percent more likely to have a bodily injury liability claim without an associated claim for vehicle damage than their conventional counterparts. Such claims are likely to result from pedestrian crashes (see *Status Report*, Nov. 17, 2011). ■



Hybrids and electric vehicles are so quiet that pedestrians can’t hear them coming. NHTSA last year finalized a rule requiring the vehicles to make noise but has since delayed the effective date.

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**IIHS** is an independent, nonprofit scientific and educational organization dedicated to reducing the losses — deaths, injuries and property damage — from motor vehicle crashes.

**HLDI** shares and supports this mission through scientific studies of insurance data representing the human and economic losses resulting from the ownership and operation of different types of vehicles and by publishing insurance loss results by vehicle make and model.

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