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2017 TOP SAFETY PICK+

Insurance Institute for Highway Safety

2017

Insurance Institute for Highway Safety

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onsumers who choose a 2017 TOP SAFETY PICK+ award winner shouldn't have trouble seeing the road on nighttime drives. Good or acceptable ratings in the Institute's new headlight evaluations set the latest crop of qualifiers apart. Thirty-eight models earn the "plus" accolade, and 44 earn TOP SAFETY PICK.

IIHS toughened the criteria for TOP SAFETY PICK+ to reflect new headlight evaluations launched in 2016. The recognition program is meant to encourage manufacturers to offer state-of-the-art protection for people in crashes, along with features that help drivers avoid crashes in the first place. In addition to good or acceptable headlights, the latter includes automatic braking technology, which has been part of the criteria since 2015.

"The field of contenders is smaller this year because so few vehicles have headlights that do their job well, but it's not as small as we expected when we decided to raise the bar for the awards," says Adrian Lund, IIHS president. "Manufacturers are focusing on improving this basic safety equipment, and we're confident that the winners' list will grow as the year progresses."

For both awards, models must earn good ratings in the small overlap front, moderate overlap front, side, roof strength and head restraint tests, as well as an advanced or superior rating for front crash prevention with standard or optional autobrake. Headlights are factored in only for the top award.

Toyota/Lexus leads manufacturers with nine 2017 TOP SAFETY PICK+ winners,

Of the 38 TOP SAFETY PICK+ winners, only seven are available with headlights that earn a good rating. Performance can vary by vehicle trim level, so consumers need to ask for the highest-rated headlights. Twenty-one award-winning models come with a standard autobrake system.

including the updated Toyota Corolla, while Honda and its Acura division pick up five TOP SAFETY PICK+ awards.

Seven models earn top headlight rating

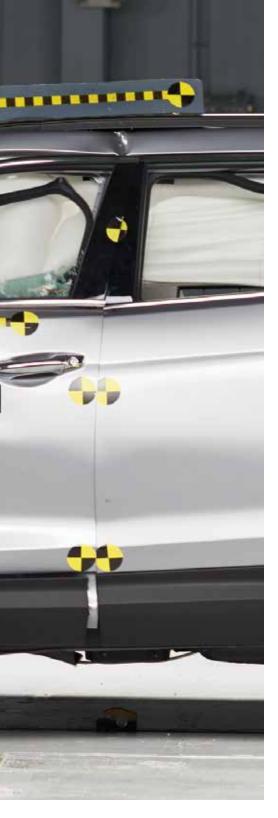
Among 2017 models, only seven are available with good-rated headlights. They are the Chevrolet Volt small car, Honda Ridgeline pickup, Hyundai Elantra small car, Hyundai Santa Fe midsize SUV, Subaru



Legacy midsize car, Toyota Prius v midsize car and Volvo XC60 midsize luxury SUV.

IIHS launched headlight ratings in the spring after finding that government standards based on laboratory tests allow for huge variation in the amount of illumination headlights provide in on-road driving. Nighttime visibility is critical to highway safety because about half of traffic deaths occur either in the dark or at dawn or dusk.

In the Institute's evaluations, engineers measure how far light is projected from a vehicle's low beams and high beams as the vehicle travels straight and on curves. Glare from low beams for oncoming drivers also is measured. Vehicles equipped with highbeam assist, which automatically switches between high beams and low beams depending on the presence of other vehicles, can get extra credit.



IIHS evaluations show that a vehicle's price tag doesn't correspond to the quality of headlights. More modern lighting types, including high-intensity discharge (HID) and LED lamps, and curve-adaptive systems, which swivel in the direction of steering, also are no guarantee of good performance.

Several manufacturers improved headlights to earn TOP SAFETY PICK+. Subaru upgraded the headlights on the 2017

2017 IIHS TOP SAFETY PICK+

Small cars	Chevrolet Volt
	Hyundai Elantra
	(sedan only; built after March 2016)
	Mazda 3
	Toyota Corolla
	Toyota Prius (built after August 2016)
Midsize cars	Honda Accord 4-door
	Mazda 6
	Nissan Altima
	Nissan Maxima
	Subaru Legacy
	Subaru Outback
	Toyota Camry
	Toyota Prius v
	Volkswagen Jetta
Midsize	Audi A4
luxury cars	Lexus ES 350
	Volvo S60
	Volvo V60
Large	Genesis G80
luxury cars	Genesis G90
	Lexus RC
Small SUVs	Mazda CX-3
	Mitsubishi Outlander
	Nissan Rogue
	Subaru Forester
	(built after October 2016)
	Toyota RAV4
Midsize SUVs	Honda Pilot
3073	Hyundai Santa Fe (built after March 2016)
Midsize	Acura MDX
luxury SUVs	Acura RDX
·	Audi Q5
	Buick Envision
	Lexus NX
	Lexus RX
	Mercedes-Benz GLE-Class
	Volvo XC60
Minivan	Chrysler Pacifica
	(built after August 2016)
Large pickup	Honda Ridgeline

For details on these and other vehicles go to iihs.org/ratings.

2017 IIHS TOP SAFETY *PICK*

Minicars	Mini Cooper Hardtop 2-door
	Toyota Yaris iA
Small cars	Acura ILX
	Honda Civic 2-door
	Honda Civic 4-door
	Lexus CT 200h
	Nissan Sentra
	Subaru Crosstrek
	Subaru WRX
	Volkswagen Golf 4-door
	Volkswagen Golf Alltrack
	Volkswagen Golf Sportwagen
	Volkswagen GTI 4-door
Midsize cars	Chevrolet Malibu
	Chrysler 200
	Ford Fusion
	Honda Accord 2-door
	Hyundai Sonata
	Kia Optima
	Volkswagen Passat
Midsize	Audi A3
luxury cars	BMW 2 series
	Lincoln MKZ
	Mercedes-Benz C-Class 4-door
Large car	Toyota Avalon
Large	Acura RLX
luxury cars	Audi A6
	Infiniti Q70
	(except V8 4-wheel-drive models)
Small SUVs	Volvo S90
Siliali Suvs	BMW X1
	Fiat 500X
	Hyundai Tucson
Midsize	Kia Sportage GMC Acadia
SUVs	
OUVS	Hyundai Santa Fe Sport
	Kia Sorento
	Nissan Murano
Midaina	Nissan Pathfinder
Midsize luxury SUVs	Cadillac XT5
luxui y 30v3	Infiniti QX60
	Lincoln MKX
Laws Olar	Volvo XC90
Large SUV	Audi Q7
Minivan	Kia Sedona

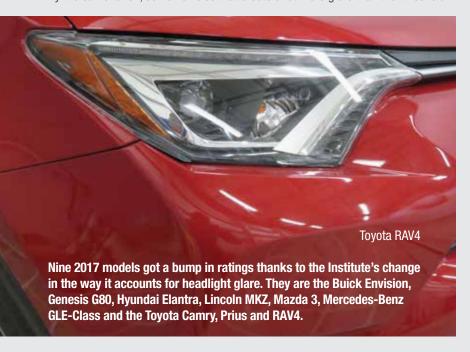
IIHS tweaks headlight rating system

IIHS has adjusted the way it accounts for glare in its headlight evaluations. The goal is to do a better job of promoting optimal visibility while still guarding against the kind of persistent glare that can impede the visibility of other drivers.

Under the original rating system rolled out in March (see Status Report, March 30, 2016, at iihs.org), headlights that created glare beyond a set threshold while traveling straight or on any of four different curves were automatically demoted to a marginal rating even if they provided good visibility. Vehicles that exceeded the threshold just a little were treated the same as vehicles with much bigger glare problems.

Since the change implemented this fall, the Institute is using a system of demerits to account for glare, just like it does for visibility. The number of demerits depends on the number of test scenarios (curves and straightaway) that show excessive glare, as well as the extent to which the glare threshold is exceeded.

The change means that a vehicle with good visibility that exceeds the glare threshold by only a small amount on a single curve could still earn a good rating. By the same token, some vehicles that create a lot more glare than the threshold



or in multiple situations will be penalized more heavily under the new system.

"Our goal of promoting good visibility without excessive glare hasn't changed," says IIHS Senior Research Engineer Matthew Brumbelow. "However, we realized that some manufacturers were 'playing it safe' and aiming their headlights low to the detriment of visibility. Our new system does a better job of balancing glare and visibility."

Far from giving manufacturers a pass on glare, the change means a vehicle with no visibility demerits but high levels of glare could earn a poor rating, something that wasn't possible under the old system.

A related change involves the extra credit awarded for vehicles with high-beam assist, which automatically switches between high beams and low beams based on the presence of other vehicles. Previously, if a vehicle had excessive glare in any of the test scenarios, it wouldn't receive the credit for that scenario. Now, any vehicle with high-beam assist will get the credit for all approaches on which the high beams provide better visibility than the low beams.

The changes are being applied retroactively, so a small number of previously released ratings have changed.

Forester to earn an acceptable rating, compared with the 2016 model's poor rating. Mitsubishi and Toyota also made design improvements. The Mitsubishi Outlander improves to acceptable from marginal, while the Toyota Prius improves to acceptable from poor.

Bundles omit top-rated features

The Infiniti Q70 and Hyundai Tucson just missed qualifying for TOP SAFETY PICK+ because of the way these automakers bundle optional safety features.

The Q70's optional front crash prevention system earns a superior rating in IIHS tests, but the headlights packaged with the autobrake option only earn marginal. The headlights that come standard on other Q70s are rated acceptable, but consumers can't get these headlights with the superior-rated front crash prevention system.

Likewise, the Tucson's acceptable-rated headlights aren't available on the model with a superior rating for autobrake. Instead, poor-rated headlights come with this version.

Autobrake is standard on more models

Manufacturers continue to refine protection for people in small overlap crashes and fine-tune crash avoidance features.

The 2017 Corolla qualifies for a TOP SAFETY PICK+ award with a good rating for occupant protection in a small overlap crash and a superior rating for front crash prevention. Toyota's prior version of the Corolla was rated marginal for small overlap protection, and the small car didn't have an available front crash prevention system.

The 2017 winner's circle includes 21 models with a standard front crash prevention system with automatic braking capabilities. These include the Acura MDX and RLX; Audi A3, A4, and Q7; Genesis G80 and G90; Lexus ES and RX; Mercedes-Benz GLE-Class; Toyota Avalon, Corolla, Prius, RAV4 and Yaris iA; Volkswagen Passat; and Volvo S60, S90, V60, XC60 and XC90. Automakers have voluntarily committed to making autobrake a standard feature on all models by 2022.

IIHS inaugurated TOP SAFETY PICK in the 2006 model year to help consumers zero in on vehicles with the best safety performance without having to sort through a lot of ratings information. The TOP SAFETY PICK+ accolade was introduced in the 2013 model year to recognize vehicles that offer an advanced level of safety. This marks the fourth time that IIHS has strengthened criteria for the plus award.

The Institute releases ratings as it evaluates new models, adjusting the list of winners throughout the year. By fall of 2016, 79 vehicles earned the 2016 plus award and 12 earned TOP SAFETY PICK.

Drivers say alcohol is bigger threat than pot

arijuana legalization won at state ballot boxes in November amid broader public acceptance of a controlled substance that is still illegal under U.S. law. Although drivers don't consider marijuana to be quite as risky as alcohol when it comes to impaired driving, those who live in states that allow recreational use are more likely to view it as a highway safety problem than drivers in states without legalized use, a new Institute survey indicates.

Voters in California, Maine, Massachusetts and Nevada approved recreational use, and medicinal use was endorsed in Arkansas, Florida and North Dakota. Montana voters also expanded an existing medical marijuana law. Eight states and Washington, D.C., now have legalized marijuana for all uses, and 20 states have comprehensive medical marijuana programs. An additional 16 states permit limited access to marijuana products, typically low tetra-

Drivers in marijuanalegal states were twice as likely to report using the drug within the past vear as drivers in the comparison states.

hydrocannabinol, high cannabidiol extracts. Marijuana is a Schedule 1 controlled substance under U.S. law.

As states increasingly permit marijuana use, the proportion of drivers testing positive for marijuana and other drugs is on the rise, and perceptions about using marijuana are

shifting (see Status Report, May 12, 2015, at iihs.org). Six in 10 Americans now favor legalizing marijuana, compared with 12 percent in 1969 when polling firm Gallup first sought public opinion on legalization.

People overwhelmingly believe driving after drinking alcohol is a risk factor in crashes, but their views on getting behind the wheel after using pot aren't as clear. To see if opinions and behaviors related to driving after using marijuana and alcohol vary among states, IIHS scientists reached out to drivers 18 and older in Colorado. Oregon and Washington, which allow recreational use, and drivers in comparison states without legalized recreational marijuana use.

The phone survey was conducted between July and October 2015. It included representative samples of 1,508 drivers in the three states with legalized recreational use, 2,510 drivers in the comparison states of Idaho, Montana, Nebraska, Utah and Wyoming and 507 drivers in other states and the District of Columbia.

Nationally, drivers overwhelmingly supported legalizing marijuana for medical use (80 percent), and a substantial minority (42 percent) favored legal recreational use by people 21 and older.

Drivers in marijuana-legal states were twice as likely to report using marijuana within the past year and more often were drinkers than the comparison-state drivers. They also were more likely to report driving within two hours of using marijuana or drinking alcohol relative to the comparison states.

Drivers in the comparison states didn't deem marijuana as problematic as drivers in recreational-use states. Forty-three percent of drivers in legal-use states said driving after using marijuana is a problem in their communities, compared with 28 percent in other states. Drivers who supported legalized recreational marijuana were much less likely to see driving after using marijuana as a problem than those who opposed legalization.

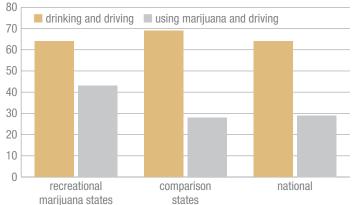
Nationally, driving after using marijuana wasn't perceived as negatively as driving after consuming alcohol, which the majority of respondents viewed as a problem in their communities.

Less than half of drivers surveyed considered marijuana's effects on driving to be about the same as alcohol's.

"The message that alcohol and driving is a dangerous combination is well-entrenched, but marijuana isn't viewed quite as negatively," says Angela Eichelberger, a senior research scientist at the Institute and the study's author. "As more states legalize marijuana use, we anticipate that perceptions about the drug's effects on driving may shift. Our survey serves as a baseline to track changes in opinions and self-reported behaviors over time."

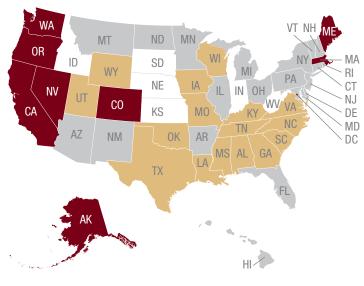
For a copy of "Survey of U.S. drivers about marijuana, alcohol and driving" by A. H. Eichelberger, email publications@iihs.org.

Percent of drivers who said driving after using alcohol or pot is a problem in their community



U.S. laws legalizing some uses of marijuana

December 2016



Safety defects, long hours at wheel are underlying factors in large truck crashes

nderstanding why large trucks crash is key to developing countermeasures to reduce those crashes. New IIHS-sponsored research shows that serious vehicle defects triple the risk of being involved in a crash. For drivers, long hours behind the wheel and use of the short-haul exemption under federal hours-ofservice rules also are important contributors to crashes.

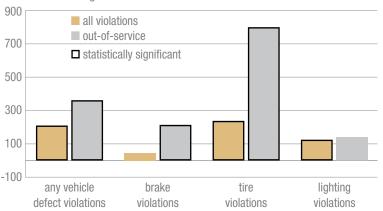
In 2015, 3,852 people died in crashes involving large trucks. Sixteen percent of these deaths were truck occupants, 69 percent were passenger vehicle occupants and 15 percent were pedestrians, bicyclists or motorcyclists.

IIHS has been studying serious crashes involving large trucks for decades, and, although the outlook has improved, IIHS research shows unsafe trucks and tired truckers persist. During the 1980s, the Institute studied large truck crashes in Washington and found that tractor-trailers with defective equipment were twice as likely to crash as trucks without defects (see Status Report, Sept. 19, 1987, at iihs.org).

The latest study updates that research and for the first time looks at the short-haul exemption's effect on crash risk. Drivers who

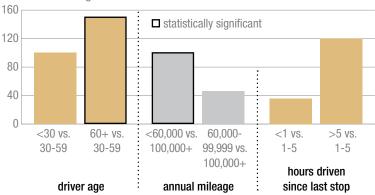
Vehicle safety violations predict crash risk...

Percent change in crash risk



...as driver factors also come into play

Percent change in crash risk



work for an interstate carrier and operate within a 100-mile radius of their work base can apply for the exemption if they work fewer than 12 hours a day and don't make overnight trips.

IIHS researchers partnered with the University of North Carolina Highway Safety Research Center and the North Carolina State Highway Patrol to investigate factors that affect crash risk for large trucks operated by interstate carriers. Researchers compared large trucks involved in serious crashes in North Carolina with injuries or deaths during 2010-12 with a sample of similar trucks that weren't involved in crashes. The matched case-control design allowed researchers to compare the relative prevalence of various factors to determine which ones are associated with increased crash risk.

Researchers collected data on a total of 197 crash and control pairs. More than a third of crashes were fatal and 17 percent involved an incapacitating injury. Crashes were more likely to occur during the daytime and to involve another vehicle besides the tractor-trailer.

Vehicle violations raise crash risk

Nearly three-quarters of the crash-involved trucks had vehicle defects identified during a post-crash inspection. Trucks with out-ofservice violations for any type of defect were more than 4 times as likely to be in a crash as trucks without such violations. The crash risk for a truck with any out-of-service vehicle defect deemed as the striking vehicle in a multiple-vehicle crash was 10 times as high as the risk for comparable trucks without vehicle defects.

A commercial motor vehicle inspector can issue an out-of-service order for a mechanical or loading problem that makes the truck a serious hazard on the road and would likely cause a crash or breakdown. Examples include faulty brakes, fraying sidewalls on tires and burned out headlights, taillights or brake lights.

Having vehicle defects of any type raised crash risk. Trucks cited for brake violations were 50 percent more likely to crash than the comparison trucks, and out-of-service brake violations tripled crash risk. Tire and lighting system violations were generally associated with bigger increases in crash risk, but researchers caution this may be the case in part because some of the violations inspectors flagged resulted from crash damage.

"Highway patrol officers and roadside inspectors serve as the front line of defense when it comes to spotting unsafe trucks, and these efforts should continue," says Eric Teoh, a senior statistician with the Institute and the study's main author. "Defects on 40-ton vehicles are a serious threat to highway safety."

Carriers with higher past crash rates were associated with an elevated current crash risk. Firms with at least 100 reported crashes per 1,000 power units (tractors or single-unit trucks) within the preceding 24 months had a 72 percent higher risk of crashing than carriers with fewer than 100 reported crashes per 1,000 power units.

"Some trucking groups have suggested that carriers shouldn't be penalized for crashes that weren't the fault of the driver or were unpreventable, but these results show counting all crashes is



meaningful. We don't always know who was at fault in crashes, and if something about a carrier's operation puts them at high risk for not-at-fault crashes, that's important to know too," Teoh says.

Tired truckers and short-haul exemption are factors

Looking at driver-specific factors, researchers found that truckers age 60 and older had a higher crash risk than drivers ages 30-59, who made up 72 percent of the crash-involved drivers in the study.

Truckers who reported driving after at least 12 hours since an extended sleep period were 86 percent more likely to crash than drivers who had been awake for less than eight hours. Truckers who reported driving more than five hours without stopping were more than twice as likely to crash as those who drove 1-5 hours.

Hours-of-service regulations govern how much time truck drivers can be on the road and when and for how long they need to rest. The current regulations allow up to 11 hours a shift and up to 77 hours over seven days (see Status Report, April 26, 2011, and Jan. 24, 2012). Driver fatigue is a significant contributor to crashes involving large trucks.

The new mandate for electronic logging devices (ELDs) set to take effect in late 2017 should help reduce the problem by making it harder for drivers to fudge the time they really spend on the highway without sufficient rest (see Status Report, Feb. 26, 2016).

Although short-haul drivers must comply with federal rules on work and rest times, they don't have to record their service hours.

Researchers found that the crash-involved trucks whose drivers operated under a short-haul exemption were less likely to operate on interstates and more likely to involve owner-operators and single-unit trucks. These trucks logged fewer miles per year than other trucks. Researchers found that drivers using a short-haul exemption had a crash risk nearly 5 times as high as those who weren't.

What is more, short-haul trucks were more likely to have inspection violations than other crash-involved trucks.

Teoh says he was surprised that the data showed a higher crash risk for trucks operating under the short-haul exemption.

"Short-haul trucks are used differently and may be more at risk if they have vehicle defects," Teoh says. "The short-haul exemption merits a more in-depth look to understand what's really going on."

Safety technologies can lower crash risk

Several safety features showed promise in reducing crash risk among the large trucks in the study. Antilock braking systems for large trucks reduced the risk of crashing by 65 percent. Antilock brakes, which keep wheels from locking during hard braking, improve driver control of large trucks during emergency stops and reduce the likelihood of a tractor-trailer jackknifing. Antilocks have been required on new tractors since 1997 and on new trailers, singleunit trucks and buses since 1998.

"We also found benefits for electronic and roll-stability control, speed governors and electronic logging devices," Teoh adds.

ESC will be required on tractortrailers and buses as of August 2017 (see Status Report, July 30, 2015). A mandate for speed limiters also is **Antilock brakes on** trucks reduced the risk of a crash by 65 percent, while having electronic or roll stability control was associated with a 19 percent lower crash risk.

under consideration, along with a requirement that trucks with a gross vehicle weight rating of 10,000 pounds or more have a forward collision warning system with automatic braking (see Status Report, Feb. 26, 2016).

For a copy of "Crash risk factors for interstate large trucks in North Carolina" by E.R. Teoh et al., email publications@iihs.org. ■

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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

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