

Status Report

Insurance Institute for Highway Safety | Highway Loss Data Institute

Higher standards

62 models meet tougher criteria to earn IIHS awards



ALSO IN
THIS ISSUE
Vol. 52, No. 9
December 7, 2017

- ▶ Voice-command systems help older drivers focus on the road
- ▶ Lund to retire as IIHS-HLDI president

Just 15 vehicles qualify for the *TOP SAFETY PICK+* award from IIHS after the requirements were strengthened to include good-rated headlights and good or acceptable passenger-side protection in small overlap front crashes.

Another 47 vehicles earn the *TOP SAFETY PICK* award, which now requires acceptable or good headlights. In contrast, headlights weren't factored in for 2017 *TOP SAFETY PICK*, and an acceptable headlight rating was enough to bump a 2017 award winner into "plus" territory.

The inclusion of a passenger-side crash test is a first for any IIHS award. The Institute developed the passenger-side small overlap front crash test after it became clear that some manufacturers weren't paying sufficient attention to the passenger side as

In a first, the criteria for the Institute's top award for 2018 includes a passenger-side test. IIHS began publishing passenger-side small overlap front ratings in October to encourage symmetric protection.

they made improvements to achieve better performance in the driver-side small overlap front test.

In 2012, IIHS began rating vehicles for protection in small overlap crashes, which involve just the front corner of the vehicle, bypassing the main structural components. It wasn't surprising that automakers acted more quickly to improve protection on the driver side than on the passenger side, and improving driver-side protection was arguably more urgent, since every vehicle on the road has a driver, while not every one has a passenger. The ultimate goal, however, was symmetric protection.

The first official passenger-side ratings were released in October, following research tests last year.

"Drivers expect that their passengers, who are often family, will be protected just as well as they are," says IIHS President Adrian Lund. "Manufacturers have been taking this issue seriously since we first shed light on it, and we're confident that good small overlap protection will become the norm on the passenger side, just as it has on the driver side."

The Institute's headlight ratings also are relatively new, with the first ones released in March 2016. Initially, few performed





2018 TOP SAFETY PICK+

Small cars	Kia Forte sedan Kia Soul Subaru Impreza Subaru WRX
Midsized cars	Subaru Legacy Subaru Outback Toyota Camry
Large luxury cars	BMW 5 series Genesis G80 Genesis G90 Lincoln Continental Mercedes-Benz E-Class sedan
Midsized SUVs	Hyundai Santa Fe Hyundai Santa Fe Sport
Midsized luxury SUV	Mercedes-Benz GLC

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

well in IIHS track tests, which measure how well low beams and high beams illuminate the road ahead on the one hand, and the amount of glare they produce for drivers of oncoming vehicles on the other.

“Headlights have long been treated as design elements instead of the critical safety equipment that they are,” Lund says. “We’re pleased to see this changing. Every one of the 62 award winners for 2018 is available with headlights that are at least acceptable.”

The 15 *TOP SAFETY PICK+* winners include four small cars, three midsized cars, five large luxury cars, two midsized nonluxury SUVs and one midsized luxury SUV. No minivans, pickups or minicars earn the highest award. Models from a wider range of vehicle types earn *TOP SAFETY PICK*, but there are no minicars in that category either.

Most of the *TOP SAFETY PICK+* awards go to two manufacturers: Hyundai Motor Co. — which owns the Hyundai, Kia and Genesis brands — has six models earning the award, and Subaru has four. Mercedes-Benz has two, while Toyota, BMW and Ford Motor Co. have one each.

Toyota Motor Corp. has the most vehicles — 10 — on the *TOP SAFETY PICK* list. Hyundai is the runner-up with nine. All but one of the seven vehicles in Subaru’s 2018 »

2018 TOP SAFETY PICK

Small cars	Chevrolet Volt Hyundai Ioniq Hybrid Hyundai Elantra Hyundai Elantra GT Mazda 3 Subaru Crosstrek Toyota Corolla Toyota Prius Toyota Prius Prime
Midsized cars	Honda Accord Hyundai Sonata Kia Optima Nissan Altima Nissan Maxima
Midsized luxury cars	Alfa Romeo Giulia Audi A3 Audi A4 BMW 3 series sedan Lexus ES Lexus IS Volvo S60 Volvo V60
Large cars	Kia Cadenza Toyota Avalon
Small SUVs	Honda CR-V Hyundai Tucson Kia Sportage Mazda CX-3 Mazda CX-5 Mitsubishi Outlander Nissan Rogue Subaru Forester Toyota RAV4
Midsized SUVs	Honda Pilot Kia Sorento Mazda CX-9 Toyota Highlander
Midsized luxury SUVs	Acura MDX Acura RDX Buick Envision Lexus NX Lexus RX Mercedes-Benz GLE-Class Volvo XC60
Minivans	Chrysler Pacifica Honda Odyssey
Large pickup	Honda Ridgeline



Award criteria

2018 TOP SAFETY PICK+

2018 TOP SAFETY PICK

G	Driver-side small overlap front	G
A or G	Passenger-side small overlap front	—
G	Moderate overlap front	G
G	Side	G
G	Roof strength	G
G	Head restraint tests	G
G	Headlights	A or G
 Advanced or Superior	Front crash prevention	 Advanced or Superior
Good G Acceptable A		

(« from p. 3) lineup earn one of the awards. The Impreza, Legacy, Outback and WRX qualify for *TOP SAFETY PICK+* when equipped with optional front crash prevention and specific headlights. The Crosstrek and the Forester earn *TOP SAFETY PICK*, also with optional front crash prevention and specific headlights. The BRZ is the only Subaru model that doesn't qualify.

Across manufacturers, the vast majority of winners qualify only when optionally equipped because front crash prevention and acceptable or good headlights aren't part of their base trims.

Automakers have pledged to make autobrake standard on virtually all passenger vehicles by 2022, but for now the technology remains mostly optional, especially on nonluxury brands.

An exception is Toyota, which has equipped all but a handful of Toyota and Lexus models with standard autobrake and other advanced features. Seven models with standard autobrake — the Toyota Camry, Corolla, Prius, Prius Prime and Highlander and the Lexus IS and NX — also have standard acceptable or good headlights and qualify for *TOP SAFETY PICK* without any added options. The addition of optional curve-adaptive headlights that earn a good rating boosts the Camry to *TOP SAFETY PICK+*.

IIHS has been recognizing vehicles with *TOP SAFETY PICK* since the 2006 model year to help consumers identify vehicles with the highest safety ratings without having to wade through information about individual tests. The *TOP SAFETY PICK+* accolade was introduced in the 2013 model year to recognize vehicles that offer a superior level of safety. Over the years, IIHS has added to and strengthened criteria for both awards, pushing automakers to speed up safety advances.

The Institute releases ratings as it evaluates new models, adjusting the list of winners throughout the year. By fall of 2017, 69 vehicles had earned 2017 *TOP SAFETY PICK+* and 51 had earned 2017 *TOP SAFETY PICK*.

"The improvements in occupant protection have been amazing over the past decades," says Lund. "All automakers now recognize the important role of safety in consumer choice, and they are increasingly receptive to working with our engineers to understand the next steps in keeping people from harm in motor vehicle crashes and to make real changes in their vehicle designs. ■"



Voice-command systems help older drivers focus on the road

Buy a new vehicle today and chances are good it will have an infotainment system for making phone calls, playing music, and getting directions — all via voice command. The idea is to help drivers access these features while still keeping their eyes on the road.

When it comes to placing phone calls, earlier IIHS research showed that voice-command systems are less visually distracting to drivers than systems requiring visual and or manual interaction, and the best ones need only one voice command, not multiple voice inputs (see *Status Report*, March 3, 2015, at iihs.org). A key question for researchers is, does the benefit of the single, more-detailed voice-command approach extend to drivers of all ages?

A new study by researchers from IIHS and the Massachusetts Institute of Technology's AgeLab indicates that design matters when it comes to how drivers, regardless of age, interact with voice interfaces, and it offers further evidence that voice-command

systems don't demand as much attention as visual-manual interfaces. Making hands-free calls using a single-step voice-command system rather than fiddling with buttons or knobs helps older drivers in particular remain attuned to the road. That is an important finding because drivers generally attend to the road less while using infotainment systems as they age.

"Some voice-command systems help drivers focus on the road more than others, but none completely eliminate visual demand or other demands on attention. In this study, we were interested in seeing how the characteristics of different voice interfaces affected drivers across a wide age range," says Ian Reagan, an IIHS senior research scientist and a co-author of three papers based on the experimental study.

Researchers compared the experience of 80 drivers 20 to 66 years old using embedded voice systems from two vehicle makes to place calls while driving in free-flowing traffic on Boston-area interstates,

Making calls using a single-step voice-command system especially helps older drivers remain attuned to the driving task.

accompanied by a research assistant. Half of the group drove a 2013 Chevrolet Equinox with the MyLink system, and half drove a 2013 Volvo XC60 with the Sensus system. A cellphone programmed with a list of more than 100 contacts was linked via Bluetooth to the infotainment systems.

Each driver was trained in how to use the vehicle system while parked and then had to use Sensus or MyLink to call four contacts using buttons and knobs, and call four contacts using voice commands.

The two systems used different design approaches. Calling a contact using voice commands with Sensus required multiple statements to navigate through different system menus, while the same task required a single detailed voice command with MyLink. The systems' visual-manual interfaces also differed. To call a contact »



Fiddling with buttons and knobs to make calls is more distracting than using a one-step voice-command system, the study found.

(« from p. 5) manually, Sensus required the driver to scroll through the contact list using a rotary knob, while, with MyLink, the driver used a rotary knob and push button to access the alphabetical range containing the desired contact and then scroll through that more limited list.

Researchers later used video footage and vehicle performance data to analyze glances to the road ahead, the time required to call each contact, errors when placing calls, and the frequency of steering-wheel movements.

In general, as age increased, drivers took longer to complete phone calls and made more off-road glances lasting longer than two seconds when placing calls relative to younger drivers. For example, for every 10-year increase in age, drivers took 3.7 seconds longer to make phone calls, and the percentage of long glances away from the road increased 0.4 percentage points. Older drivers also made more errors when using the different systems.

However, the single voice-command approach eliminated age-related decreases in attention to the forward road. Drivers of all ages kept their eyes on the road about 85 percent of the time when they were making calls with MyLink's single voice-command system. In comparison, drivers spent less time looking at the road ahead when using the buttons or knobs with either system and Sensus's multiple voice inputs, and the percentages decreased significantly with age. Similarly, the average length of glances to the road ahead increased with age for drivers using MyLink's single voice-command system but decreased with age for drivers using the Sensus multistep voice interface.

"Age-related changes in attention, including the demands of using a phone while driving, are well-known," Reagan says. "This study contributes new information to the field by showing that the single-command voice interface design to some extent controlled the age-related decrements in attention by allowing drivers of all ages to look at the road more when placing phone calls compared with a multistep voice system or traditional visual-manual interfaces."

For a copy of "The effects of age, interface modality, and system design on drivers' attentional demand when making phone calls while driving on a limited-access highway" by I.J. Regan et al., email publications@iihs.org. ■

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Lund to retire as IIHS-HLDI president

Adrian K. Lund will retire in January as president of IIHS and HLDI after a distinguished career of substantial and long-lasting contributions to the highway safety field. He is succeeded by David L. Harkey, who joins IIHS-HLDI this month following his role at the helm of the University of North Carolina Highway Safety Research Center.

Lund, 68, joined the Institutes in 1981 as a behavioral scientist and has served as president since 2006.

Lund's work includes evaluations of the effectiveness of alcohol-impaired driving and safety belt use laws, studies of how speed limit changes affect crash risk and analyses of how vehicle design changes improve crash protection. As IIHS-HLDI president, Lund initiated new crash test programs to inform consumers about the vehicles that provide the best overall protection. He launched the first consumer evaluations of crash prevention technologies and led the \$30 million expansion of the Vehicle Research Center to enable testing of current and future automated vehicles.

Recent work includes seminal research on the effects of crash avoidance technologies, how crash risk has changed in states that legalized recreational use of marijuana, the benefits of all-offender alcohol interlock laws and how photo enforcement is reducing red light running and speed-related crashes. Lund has served on many government and nongovernmental committees addressing highway safety issues.

Harkey, 54, has directed UNC's Highway Safety Research Center since 2006 and has more than 30 years' experience in road safety research. As an engineer, the majority of his work has focused on improving roadway design and operations for all users, including motorists, pedestrians and bicyclists. Harkey has collaborated with IIHS researchers on past projects and in August was the keynote speaker at the Institute's second roundtable on the problem of large truck underride crashes.

The Institutes' work, supported by insurers, has been instrumental in making highways and vehicles safer. IIHS research helped lead to stricter laws on alcohol-impaired driving, graduated licensing laws for

teen drivers, higher safety belt use rates, airbags and more crashworthy vehicles. Today, IIHS is a leader in testing and evaluating new technologies on vehicles that can prevent some crashes from happening altogether.

"Recognizing that the full benefits of advanced technologies will only accrue decades from now, we need to continue to remind policymakers of the many proven countermeasures we could be deploying



David Harkey (left) will succeed Adrian Lund (right) as the next president of IIHS and HLDI. Lund, who will retire in January, has served as president since the 2006 retirement of Brian O'Neill (center).

"Our roads and vehicles are much safer today because of the strong and internationally respected work of IIHS and HLDI," Harkey says. "Even with so much progress, it is unacceptable that 100 lives are still lost in crashes every day. As we work with our safety partners toward the goal of zero crash deaths, we will continue to conduct high-quality research about ways to reduce crashes and the deaths, injuries and property damage that result from them. We will build on the Institutes' groundbreaking research and testing of crash avoidance technologies — the foundation for autonomous vehicles — to steer consumers toward the systems that perform the best and speed the adoption of effective systems on all new vehicles."

IIHS-HLDI research is guided by the Haddon Matrix, the most commonly used paradigm in the injury prevention field. It shows the problem of motor vehicle crashes can be mitigated by changing one or more factors — people, vehicles and/or the road environment — at any point in the progression of a crash. It is named for Dr. William Haddon Jr., who served as IIHS president from 1969 until his death in 1985.

more widely right now to save lives. I look forward to working with the Institutes' tremendously talented, dedicated and productive staff to move our mission forward," Harkey says.

The Boards of Directors of IIHS and HLDI launched a search for a new president earlier this year after Lund announced his intention to retire.

"The search committee interviewed many talented and qualified candidates," says IIHS Board Chairman Floyd Yager. "We believe that Dr. Harkey has the best combination of leadership and research experience to further the Institutes' vital mission and be a strong voice in what is needed to reach zero traffic deaths. We look forward to working with him on the next phase of the Institutes' work." Yager is senior vice president, property product management, at Allstate Insurance Company.

"David has the right abilities and qualifications to head the Institutes at this time of tremendous opportunity," Lund says. "His wealth of experience in our field will help insurers continue to lead the way in preventing harm from motor vehicle crashes." ■

The 62 winners of the 2018 IIHS safety awards meet tougher standards ▶ 2

Voice-command systems help older drivers focus on the road ▶ 5

Lund to retire as president ▶ 7

Vol. 52, No. 9
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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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