

Driven

NADA MANAGEMENT SERIES

SL37



A DEALER GUIDE TO

High-Tech Vehicle Safety



NATIONAL
AUTOMOBILE
DEALERS
ASSOCIATION

The National Automobile Dealers Association has prepared this guide to assist its dealer members in being as efficient as possible in the operation of their dealerships. The presentation of this information is not intended to encourage concerted action among competitors or any other action on the part of dealers that would in any manner fix or stabilize the price or any element of the price of any good or service.

Safety feature icons pictured on cover, clockwise from top right: adaptive cruise control, automatic emergency braking, blind-spot warning, drowsiness alert, lane departure warning, adaptive headlights and pedestrian detection.

Images from MyCarDoesWhat.org are used with permission.

PREFACE

This guide provides basic information on the Advanced Driver Assistance Systems (ADAS) available in today's vehicles. Importantly, an ADAS feature's design and functionality can vary by vehicle make, model and trim level. Employees should strive to learn about the ADAS features in the new and used vehicles they sell in order to explain them to customers. Customers who do not understand an ADAS feature may fail to appreciate its potential safety benefits and may even fail to use it properly.

Employees and customers also should recognize that ADAS features assist vehicle drivers with the safe operation of vehicles. No ADAS feature, working individually or together with other ADAS features, can drive a vehicle. Thus, *drivers must always stay engaged with the task of driving when behind the wheel.*

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High-Tech Vehicle Safety

THE INSURANCE INSTITUTE FOR HIGHWAY SAFETY (IIHS) **ESTIMATES** THAT

automatic emergency braking systems (AEB), when built into all new light-duty cars and trucks, will prevent 28,000 crashes and 12,000 injuries by 2025. IIHS research also shows that AEB containing both forward collision warning (FCW) and crash-imminent braking (CIB) reduces rear-end crashes by half, while FCW alone cuts them by more than a quarter.

Even more impressive, 57% of drivers in a [survey](#) covering 72,000 vehicles equipped with these kinds of features—collectively called Advanced Driver Assistance Systems, or ADAS—said the features actually helped them avoid a crash.

The new vehicles dealerships sell today are likely to be equipped with ADAS or to offer ADAS as options. But prospective purchasers often know little about ADAS features, or understand how they work, what they can and cannot do, and how they can help all drivers to be safer.

This guide, then, focuses on the ADAS features, with particular attention to an educational campaign developed by the National Safety Council (NSC) and the University of Iowa and called *MyCarDoesWhat?* It is important that dealership sales staff become educated on the ADAS available in the vehicles they sell and learn how best to teach prospective purchasers and customers how to use ADAS safely.

Intended primarily for those dealership employees—sales consultants or product specialists, for example—who explain vehicle features to customers, the guide also acquaints staff with a thorny issue: Most of the ADAS features lack standardized names and functionality. ADAS features with similar names may operate differently or even have different purposes. Some, for example, aim to avoid crashes; others, with similar names, aim to reduce crash severity. Conversely, features with different names may do essentially the same thing.

The problem is a serious one. For consumers, a name that is misleading can lead to confusion or misuse. For dealers, who often sell more than one brand of new vehicle and multiple brands of used vehicles, understanding the various names and aims of ADAS technologies is key to educating customers.

The Case for ADAS

According to NSC estimates, U.S. motor vehicle fatalities topped 40,000 annually in recent years, with another 4.5 million people a year suffering serious injury in crashes. The National Highway Traffic Safety Administration (NHTSA) estimates that 94% of all traffic accidents involve human error. NHTSA analyses also indicate that driver-related crashes most frequently occur due to inattention, internal and external distractions, and inadequate surveillance. Other significant reasons include driving too fast for conditions, misjudging others' speed, sleeping at the wheel, and illegal actions.

40,000
U.S. MOTOR VEHICLE FATALITIES

Let's put some numbers to driver-related crashes. In the most recent year for which NHTSA has complete data, speeding killed 9,717 people. Drunk driving killed 10,784 people. Distracted driving killed 3,166. Of the distraction-affected crashes, cell phones were in use in 434 fatalities. Although distracted driving encompasses eating and drinking, conversing with passengers in the vehicle, tuning the radio, checking the navigation system—anything that takes atten-

tion away from driving—text messaging is the “most alarming distraction,” according to NHTSA, because texting takes the driver's eyes off the road for five seconds, which at 55 mph is “like driving the length of an entire football field with your eyes closed.” And then there were those who literally drove with their eyes closed: Drowsy driving took 795 lives in the same year. (See NHTSA's “[Risky Driving](#)” section for more information, including the growing problem of



**PERCENTAGE OF
TRAFFIC ACCIDENTS
DUE TO HUMAN ERROR**

marijuana-, opioid- and methamphetamine-impaired driving.) Reducing human error, and thereby exponentially improving the safe operation of cars and trucks, and public safety in general, makes the case for ADAS.

Simply put, the proper use of ADAS can dramatically reduce traffic injuries and deaths.



NADA has always worked closely with NHTSA and other government and private organizations dedicated to vehicle safety. We've disseminated information on crash tests and safety ratings. We've worked with NHTSA on airbag switches. We've campaigned to seat "baby in the back," explaining the various types of child safety seats and booster seats. We have also promoted tire safety and lobbied for primary seat-belt laws—permitting traffic stops solely for belt-use violations—which tripled the use of seat belts nationwide.

And now NADA is spreading the word about the campaign NSC and Iowa created—*MyCarDoesWhat.org*. This very rich, very entertaining site has a very serious mission, summed up in its tagline: Know More. Drive Safer.

MyCarDoesWhat.org describes the abundance of ADAS safety features that have been introduced since seat belts

and airbags. For years, in concert with improving these original safety devices and installing them in every car, vehicle design has focused on withstanding crashes, resisting rollovers, and protecting occupants. As technology has become smarter and more agile, designers are taking safety to a new level, aiming to avoid crashes altogether.

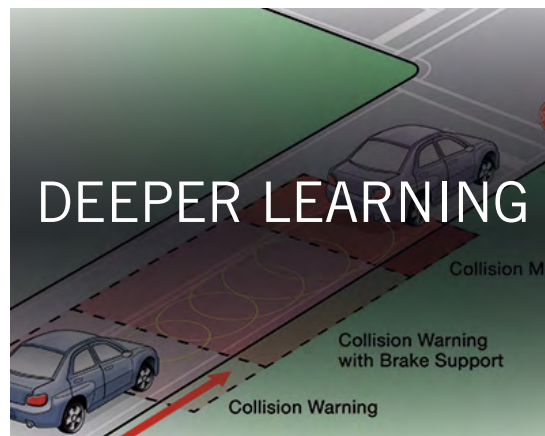
That's the other part of the case for ADAS: The technology is available today in new cars and trucks. And that technology will become even smarter with continuing improvements. What's needed now is awareness of the ADAS features, and the knowledge to use them correctly.

Dealership sales staff and their customers stand to learn a great deal about the technology that's in their new vehicles through *MyCarDoesWhat*.

Let's take a tour of the site.

MyCar DoesWhat.org

Know More. Drive Safer.



MyCarDoesWhat.org

Of the six tabs at the top of *MyCarDoesWhat's* homepage—safety features, resources, blog, social, about and the future—“about” has the fewest moving parts. “About” describes the “who,” “what” and “why” of *MyCarDoesWhat*.

The who: The [National Safety Council](#) is a nonprofit organization founded in 1913 and chartered by Congress in 1953. Its mission is “to save lives by preventing injuries and deaths at work, in homes and communities, and on the road through leadership, research, education and advocacy.” NSC has long been a leader in transportation safety, focusing particularly on distracted driving and teen driving. It pioneered defensive driver education, designated April as “Distracted Driving Awareness Month” and leads [Road to Zero](#), a national initiative to eliminate traffic fatalities by 2050. Additionally, NSC offers employers a variety of online safe-driving courses for their employees. Tailored to each participant’s profile—including age, sex, driving behaviors and attitudes, and vehicle driven—the courses focus on defensive driving and distracted driving. There’s even a professional truck driver course.



The University of Iowa’s College of Engineering houses the [National Advanced Driving Simulator \(NADS\)](#), an independent, self-sustained transportation safety research center within the Iowa Technology Institute. The most sophisticated driving simulator in the world, the NADS conducts research studies for the private and public sectors to save lives, improve motorists’ quality of life, and increase the efficiency and productivity of the automotive and supporting industries. The NADS was originally funded by NHTSA to study everything from crash avoidance to new safety technologies to the effects on driving of alcohol, drugs, visual impairment and aging—all in a safe, accurate and repeatable environment.



The what: *MyCarDoesWhat.org* is a national driver safety education campaign. It focuses on new vehicle safety technologies that aim to prevent crashes by increasing vehicle stability, helping the driver gain and maintain greater control, providing warnings about imminent

threats, and even intervening to avoid crashes or reduce crash severity.

The why, of course, is to educate drivers in the best use of the new technologies, so they can drive more safely.

The “resources,” “blog” and “social” sections contain videos, quick guides, graphics, PSAs, YouTube clips, games and quizzes, news, and Facebook posts—all in the service of “safety features,” which is the heart of the website.

MyCarDoesWhat explains some 40 (and counting) safety technologies with text, video, graphics, games and more. Many of the features are included in optional packages for individual models available now, and some—like electronic stability control (ESC), anti-lock braking system (ABS), tire-pressure monitoring system (TPMS) and the back-up camera—are already standard in all new cars sold in the U.S.

Surveys show that many drivers don’t understand even these standard technologies. With ABS (as with many of the features we’ll detail below), drivers have often said the vehicle was behaving in a way they didn’t expect. And nearly 50% of drivers have no idea what TPMS is (or that tire problems cause 11,000 crashes a year).

Dealership sales staff should learn the safety features in their own inventory. Both staff and customers can use *MyCarDoesWhat* as a resource and reference.





Forward Collision Warning

Forward collision warning can alert drivers of an impending collision with a slower-moving or stationary car directly in front.

WHAT IT DOES

Warns of a hazard ahead to enable timely braking or swerving.

WHAT IT DOES NOT DO

Forward collision warning alone will not automatically brake.

4 Safety Features, 10,000 Lives

IIHS estimates that just four ADAS technologies, when deployed in all passenger vehicles, could prevent or mitigate as many as 1.86 million crashes and save more than 10,000 lives per year. The technologies: forward collision warning/mitigation—typically paired with automatic emergency braking—lane departure warning/prevention, side-view assist/blind-spot warning, and adaptive headlights. While these features cannot substitute for safe, alert, hands-on-the-wheel driving, dealership customers should be made aware of the technologies' abilities, functionality and limitations—and the often significantly different names for each of them. *MyCarDoesWhat* presents the information, and the caveats.

FORWARD COLLISION WARNING (FCW) is designed to prevent rear-end crashes, the most common type of vehicle accident. This technology can alert the driver to an impending crash with a stopped or slow vehicle ahead, allowing time to brake or swerve in order to avoid the vehicle. The feature works by scanning the road ahead using camera- or radar-based sensors. If it detects a stationary or slow vehicle in its path, it uses sounds, flashing lights, graphics, vibrations, brake

pulses—or all of the above—to warn the driver. Some forward collision warning systems will even tug on the driver's seat belt. Most systems pre-charge the brakes to maximize their effect if the driver responds to the warning. If the driver doesn't brake or steer to avoid a collision, some systems may close the windows, tighten the seat belts, or adjust the seats and head restraints to reduce injuries. Some systems can detect bicycles, motorcycles, pedestrians or other obstacles ahead. Some systems also may automatically slow the vehicle or even brake in an emergency (see automatic emergency braking below). Drivers—and dealership sales consultants—have to know the particular vehicle to know exactly what the system will and won't do.

Most forward collision warning systems can't adjust for varying road conditions. Further, the sensors may not work if they're blocked by rain, ice or snow, and they may not work well in fog, in a tunnel, or in the glare of sunrise or sunset. And the sensors must be clear, which means drivers have to know where they are located.

HOW TO USE FORWARD COLLISION WARNING



1. Scan

Scan the road ahead and maintain a safe following distance.



2. Be Alert

Warning tones or visual alerts will warn drivers that a collision is about to occur.



3. Prepare to Brake

Brake or steer to safety to avoid a crash.



Automatic Emergency Braking

This feature can sense slow or stopped traffic ahead and urgently apply the brakes if the driver fails to respond.

WHAT IT DOES

Uses sensors to track cars ahead and automatically apply the brakes in an impending crash.

WHAT IT DOES NOT DO

It can't always prevent a rear-end collision, but may lessen the severity.

Manufacturers use a variety of names for this technology, including forward crash warning, pre-crash system, collision mitigating system, collision avoidance system, forward collision avoidance system, rear-end crash avoidance system and automotive collision avoidance system.

AUTOMATIC EMERGENCY BRAKING (AEB) is typically paired with forward collision warning. When AEB detects an imminent collision, forward collision warning uses sounds and visuals to warn the driver. If the driver does not respond by slowing down or steering away from the other vehicle, AEB automatically applies the brakes, engaging dynamic brake support or crash-imminent braking. While it can't always prevent collisions, AEB might lessen their impact.

With more than 4 million rear-end collisions every year, OEMs and the government are moving to include AEB in most passenger vehicles. Beginning with model year 2018, AEB was added to the list of recommended safety features in NHTSA's New Car Assessment Program (NCAP) 5-Star Safety Rating system, and OEMs have committed to making AEB standard in

most light-duty vehicles by 2022.

AEB generally activates at highway speeds, but newer, more advanced systems can also work in the city. The feature relies on clear sensors, and it may not detect smaller vehicles such as motorcycles and bicycles. Again, AEB is not standard across manufacturers—it goes by different names, and doesn't always bring a vehicle to a full stop—and it's not infallible. Drivers should always keep a safe following distance from vehicles ahead.

LANE DEPARTURE WARNING addresses another accident waiting to happen. Drifting out of lane causes nearly 10% of crashes annually. IIHS estimates that if all passenger cars had lane departure warning systems, 55,000 crashes could be prevented annually. NHTSA identifies sideswiping and rollovers as the types of crashes this technology could help prevent.

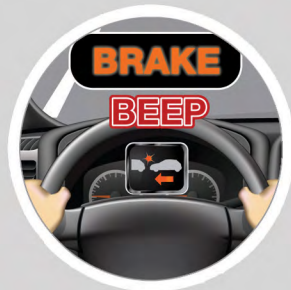
Driving for an extended period can be a recipe for getting tired and losing focus. Veering out of lane, perhaps into the pathway of another vehicle, can be a consequence of such distracted driving.

HOW TO USE AUTOMATIC EMERGENCY BRAKING



1. Scan

Scan the road for hazards and maintain a safe following distance.



2. Be Alert

If in a collision-imminent situation and the driver has not responded, the car will automatically brake hard. Warning tones and other visual alerts may also activate during or after the emergency event.



3. Take Action

Brake or steer to avoid the hazard ahead. If a driver fails to brake or steer, the vehicle will slow down rapidly or stop on its own to avoid a crash.



Lane Departure Warning

Lane departure warning systems alert a driver who is drifting out of lane using visual, vibration or sound warnings.

WHAT IT DOES

Works on highways when painted road lines are clear and bright on both sides of the lane.

WHAT IT DOES NOT DO

Doesn't work when lane lines are covered or faded.

Lane departure warning uses cameras, usually mounted on or near the rear-view mirror, to read the painted lane markers. When drifting is detected, it uses sound, visual icons or vibrations of the steering wheel or seat to warn the driver to stay in lane. The system doesn't work if lane lines are faded, or covered by snow or leaves, or if the road curves a lot. Some systems only operate at speeds over 35 miles per hour. Using the turn signal will override the warning.

Some vehicles have **LANE-KEEPING ASSIST** (also called lane-centering assist or lane-keeping support), which nudges them back into the center of the lane by steering automatically. The driver will have to override that when deliberately driving close to the left or right side of the lane to avoid a pothole, or a bicyclist or motorcyclist. Turning the wheel will cancel lane-keeping assist.

Some vehicles allow drivers to adjust the lane departure warning system, or turn it off. Drivers who do not understand the technology may find the warnings annoying and turn the system off, negating its potential safety benefits.

BLIND-SPOT WARNING alerts drivers to vehicles in their blind spots so they can safely change lanes. The warning, which may turn on upon starting the vehicle, uses flashing icons on the side mirrors or the windshield frame (A pillar). Some blind-spot warning systems may use sound, and some may give additional alerts if the turn signal is activated and there's already a vehicle in the next lane. Some vehicles have a side-view camera, activated by the turn signal.

Blind-spot warning uses sensors and is designed mostly for highway use. The sensors may not detect very fast- or slow-moving vehicles, motorcycles or bicycles. And sensors blocked by moisture, snow or dirt may not work.

Drivers should always look over their shoulders and exercise care when changing lanes. Like other ADAS features, this technology has various names depending on the manufacturer. It may be called blind-spot monitor, passive blind-spot monitoring, blind-spot information system, blind-spot assist or side blind-zone alert.



Blind-Spot Warning

This feature warns of cars in drivers' blind spots. The feature may provide an additional alert when a turn signal is used but there is a vehicle in that adjacent lane.

WHAT IT DOES

Uses a symbol, sound or vibration to let drivers know there are vehicles located in their blind spots.

WHAT IT DOES NOT DO

May not detect motorcycles or very fast-moving vehicles.



Adaptive Headlights

Adapt to changing roadway conditions—such as curves—to better illuminate the roadway.

WHAT IT DOES

Headlights actually move side to side as the steering wheel turns.

WHAT IT DOES NOT DO

Normally, feature does not automatically switch from low beams to high beams.

ADAPTIVE HEADLIGHTS better illuminate the roadway by moving side to side and (depending on the model) up and down as the driver turns the wheel to follow the curves and hills and valleys of the roadway. With adaptive headlights, a driver can see another car, a deer or a person sooner and better, particularly at night or in low-light situations. Some advanced adaptive headlights automatically turn on the high beams when a vehicle is alone on the road, dimming the lights when there's oncoming traffic.

Adaptive headlights use sensors that detect a vehicle's steering angle. Other names for this feature include active headlights, adaptive front-lighting systems and intelligent headlamps.

The importance of headlights cannot be overstated. Indeed, traditional headlights on new vehicles have become brighter and crisper as a reaction, in part, to criticism. Despite advances in vehicle lighting and lighting design, IIHS studies found headlights to be

poorly aimed, which can cause unacceptable glare to oncoming traffic. Since almost half of fatal traffic accidents occur at night, sharp and focused headlights are a first defense against crashes.



ADAPTIVE HEADLIGHTS



1. Use

Adaptive headlights adjust to help drivers see on dark curved roads and over hills.



2. Steer

They move when the wheel is turned.



3. Scan

Be aware of objects ahead.

More Safety Features

Let's take a look at some additional features designed to assist safe driving.

AEB and FCW aim to reduce rear-end crashes. *MyCar-DoesWhat* explains that adaptive cruise control (ACC) and speed warnings can also help prevent or mitigate such collisions.

ACC is the next-generation cruise control. It not only lets the driver set the desired speed; it automatically adjusts the speed to keep pace with the vehicle ahead while maintaining a safe following distance. The driver sets the following distance—for example, three or four seconds. If that distance changes because the vehicle ahead is slowing down or speeding up, ACC uses the engine and brakes to adjust the speed and maintain the set following distance. Advanced versions of ACC can slow and stop a vehicle in traffic jams, accelerating when appropriate.

ACC uses cameras, lasers or radar to scan the road ahead. If the sensors get covered by rain or snow, the system will automatically shut off. In bad weather or unsafe conditions such as slippery roads, ACC may not function correctly, as the system will not consider road conditions when adjusting speed through braking. ACC also may not work in tunnels, and it may not detect traffic appropriately on curving roads, as it looks directly ahead. Most systems only work at set speeds over 25 miles per hour. Dealership sales staff need to know how ACC systems work on the models they sell.

Other ADAS technologies that help drivers control their speed are **CURVE SPEED WARNING** and

HIGH-SPEED WARNING. These features use the vehicle's GPS to address speeding, which is involved in 30% of all car crashes. Curve speed warning lets the driver know to slow down for an approaching curve or exit. High-speed warning, which may be part of the vehicle's infotainment system or the individual's smart phone GPS app, alerts the driver when exceeding the speed limit. The driver's GPS must be up-to-date so the speed can be compared against an accurate database of speed limits, which still may not include school and work zones. Some vehicles have a camera that can read speed limit signs.

To avert crashes at low speeds, ADAS technologies focus on detection systems and left turns.

LEFT-TURN CRASH AVOIDANCE activates warning sounds and lights, and even applies the brakes, if it detects that the driver is turning left into the path of another vehicle. This system works only at low speeds.

PEDESTRIAN DETECTION uses radar and stereoscopic cameras to detect human movement in every direction—in front, at the side or at the rear of the car. More effective at lower speeds (25 miles per hour or slower), the system alerts the driver with a sound or warning light on the dash. Some pedestrian detection systems automatically brake if the driver doesn't respond (see PAEB below); at minimum, the systems help reduce speed enough to lessen the impact of a collision. Researchers are working on infrared technology to enhance pedestrian detection, particularly at night. This technology is not a substitute for each driver's own eyes, ears and brain: even a computer



Adaptive Cruise Control

Not only maintains a set speed, but the following distance as well; provides some limited braking.

WHAT IT DOES

Automatically speeds the vehicle up and slows it down to keep a set following distance relative to the car ahead. Provides some braking.

WHAT IT DOES NOT DO

Drivers need to understand how much braking the system can do—some will brake to a stop, but most will only brake so much.



Pedestrian Detection

Uses advanced sensors to detect human movements; some versions may urgently apply the brakes if the driver fails to respond.

WHAT IT DOES

Alerts the driver or automatically brakes if there is a pedestrian in the path within a certain speed range—generally below 25 mph.

WHAT IT DOES NOT DO

Steer.

can't predict when a child might suddenly step off a curb in front of a vehicle.

BICYCLE AND OBSTACLE DETECTION systems also use radar to help avoid collisions at low speeds. Bicycle detection systems can only “see” bicycles that are in front of the car and moving in the same direction. Obstacle detection systems, with which many people are familiar as a parking aid, use sensors mounted in the front and rear bumpers to measure the distance between the vehicle and objects directly around the bumpers (such as a hydrant or a guard rail). The obstacle detection feature alerts the driver with sonar-style beeps that often become faster as the vehicle gets closer to the obstacle. The sensors have to be kept free of debris—and bumper stickers. And, as is usually the case, this feature varies among manufacturers.

Several ADAS technologies focus on braking and preventing rollovers.

In addition to ABS and AEB, there's **BRAKE ASSIST**. This feature comes to the rescue when the driver is braking to avoid rear-ending another vehicle. Brake

assist senses the urgency and brakes even harder, applying maximum force in order to avert a crash or lessen its severity.

TRACTION CONTROL is not a new safety feature. An early version was incorporated in some vehicles as far back as the 1970s; the current version is standard on new vehicles. It's one of those features, like **ELECTRONIC STABILITY CONTROL (ESC)**, that stays in the background and engages when it's needed. Traction control helps prevent the vehicle's wheels from spinning on icy, snowy or wet roads and provides more traction when the driver needs to accelerate. Traction control should generally be left on but can be turned off if the vehicle is stuck in snow or mud and the driver needs to rock the car to free it, or when tire chains are used.

ESC, on the other hand, cannot be turned off. This feature engages automatically to stabilize the car during difficult steering situations, helping to prevent skids or rollovers and keep the driver in control. ESC works by continuously analyzing a driver's steer-



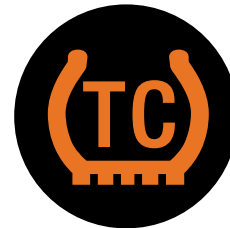
**BICYCLE
DETECTION**



**OBSTACLE
DETECTION**



**BRAKE
ASSIST**



**TRACTION
CONTROL**



**ELECTRONIC
STABILITY CONTROL**

ing, wheels and direction. If it senses the vehicle is about to spin, ESC takes control of one or more of the wheels, adjusts braking and acceleration, and keeps the vehicle headed in the intended direction. Drivers still have to remember to slow down on curves, and to increase their following distance on slippery roads.

To work effectively, ESC relies on ABS—which of course helps prevent the vehicle's wheels from locking during a hard stop so the driver can continue to steer. And both ESC and ABS need properly inflated tires in good condition. The **TIRE PRESSURE MONITORING SYSTEM (TPMS)** will advise if the air pressure inside the vehicle's tires is at the correct level or if the tires are over- or under-inflated.

ADAS providing backing assistance include the **BACK-UP CAMERA** and **BACK-UP WARNING**, but that's not all. Even when the back-up camera shows a clear backing path, vehicles at the side will be out of camera range. **REAR CROSS TRAFFIC ALERT** can detect vehicles approaching from the left and right rear. It will beep or alert the driver to brake with a flashing light on the mirror or dash. This system only works when the backing path is straight; it doesn't work in angled parking spaces.

Two ADAS features help with hills. **HILL START ASSIST** helps keep the vehicle from rolling backwards when it's stopped on a slope. It momentarily holds the brake while the driver switches from the brake to the accelerator. Some versions even prevent roll-forward when the vehicle is stopped downhill. This system may not work on extremely steep hills or in slippery road conditions. **HILL DESCENT ASSIST** applies the brake as needed to maintain a steady, safe speed when driving

downhill, allowing the driver to focus on steering. At some point, the driver can set a desired speed. Hill descent assist can help with driving over slippery or uneven terrain. In some cars, it will work in reverse.

There are more ADAS technologies and refinements than this guide can describe in detail, but let's address one more feature. You may recall that drowsy driving was responsible for 795 deaths in a single year. The **DROWSINESS ALERT** feature aims to avert accidents by warning drivers to take a break. This feature may display a picture of a coffee cup or other message on the dash or entertainment console. Some systems deliver messages verbally. The technology that senses the driver is sleepy borrows from lane departure warning to monitor a vehicle's position in the driving lane. A camera reads the lane markings and looks for changes, remembering how often the vehicle drifts from the center of the lane. More advanced versions of drowsiness alert can learn an individual's driving pattern and flag deviations. Others can read the driver's face and eyes for drooping eyelids or a nodding head.

Dealership staff and customers should consult *MyCarDoesWhat* regularly for up-to-date information on ADAS features and advancements, but remember that no matter how smart a vehicle is, drivers must be smarter. Although ADAS technologies are designed to assist drivers with safe driving, they are no substitute for good driving behaviors and judgment.



Drowsiness Alert

This feature may alert drivers experiencing drowsiness to take a break.

WHAT IT DOES

A coffee cup or other symbol appears on the dash suggesting a break.

WHAT IT DOES NOT DO

This system will not necessarily steer back into the lane.

Keeping Up With ADAS

Dealership sales staff should pay close attention to the ADAS information they receive from the new-vehicle manufacturers they represent. In addition, *MyCar-DoesWhat* provides links to top auto brands sold in the U.S., allowing perusal of model-specific safety features and OEM- and model-specific owner's manuals. The manuals, which describe and illustrate key ADAS safety features using brand-specific nomenclature, can be especially helpful when questions arise in the used-vehicle sales department. Unlike child car seats, seat belts and airbags, however, ADAS features are not necessarily described under "safety." They can be located, for example, under "driving support systems," "driver assistance," "driving aids," "vehicle features" or simply "driving and operating." Further, since certain systems are optional and can vary with trim packages, it is important to know if a specific vehicle is equipped with particular ADAS features.

The NHTSA website also allows searches for safety technologies by year, make and model [here](#). NHTSA also offers an ADAS [Vehicle Shopper's Guide](#) for download, and commentary on various ADAS features. One feature it describes is pedestrian automatic emergency braking. PAEB automatically applies or supplements the brakes if a pedestrian is in the way of a moving vehicle—or if the

system, using a camera and radar, determines that the pedestrian *will* be in the way. It also describes automatic crash notification systems that can notify emergency responders of a crash and its location. NHTSA offers animations, fact sheets and on-target videos starring Adam Savage, a well-known industrial and special effects designer, actor, educator and television personality. The safety videos can also be viewed on [SaferCarTV](#).

IIHS rates new model vehicles based on a variety of crashworthiness and crash avoidance criteria. Its "[Top Safety Picks](#)" must have front crash prevention and specific headlights. IIHS also offers [commentary, with animations](#), on selected ADAS features. Like NHTSA, IIHS has a very informative [YouTube channel](#).

Please see the "Selected Bibliography" at the back of this guide for other organizations with vehicle safety information.

Important note: When educating customers about the safety features in their vehicles, dealership staff should emphasize that drivers should not try to defeat ADAS features or rely on them exclusively. Drivers must always pay attention to driving, to traffic, and to the terrain and weather conditions.



What Dealerships Can Do

As the main link between customers and their new vehicles, dealerships play a central role in educating consumers about the features, capabilities and operation of the vehicles they sell and service. Their effectiveness in that role depends on how well they educate themselves.

The safety technologies discussed in this guide—the ADAS features—are *active* technologies. In contrast to such passive safety features as airbags and electronic stability control, active technologies typically require a driver's attention.

Sales staff and customers alike should avoid any suggestion that “these cars are so advanced they can basically drive themselves.” In fact, ADAS technologies require drivers to know more, not less, about how their vehicles operate. And since ADAS features are not necessarily intuitive, misunderstandings can compromise safety.

Customers should not be told, for example, that a pedestrian detection system is active at any speed when it only really works well at speeds under 25 miles per hour. A customer driving at a faster speed may expect the vehicle to react to a pedestrian walking near the vehicle, but the vehicle would be unable to issue this warning.

Or consider a scenario where a sales employee assures a customer that a lane departure warning system will correct a vehicle's position in the lane, but in reality that system does not steer. In that case, the wrong information could lead to a collision.

Given that ADAS technologies vary by manufacturer, make and model, sales employees really need to do their homework in order to provide customers with the accurate information they need to understand what their vehicles can do and how to use ADAS properly—and so they're not tempted to turn off potentially life-saving features out of ignorance.

Educating Dealership Sales Staff

Dealership sales staff should take advantage of manufacturer-specific training on product features. In addition, for a basic overview of ADAS features, they can use this guide, *MyCarDoesWhat* and the other resources we refer to. Dealers should make sure to re-train staff as necessary to accommodate employee turnover and the fact that new ADAS features are continuously being introduced, improved and updated.

Sales staff training can include a combination of web-based modules and classroom sessions, but hands-on training is most effective for learning about ADAS. This can consist of instructor-led sessions followed by test drives and system demonstrations. It is important that sales staff drive the vehicles themselves to become familiar and comfortable with the technology, and to understand how and when systems work. Sales staff who participate in this kind of experience-based training will be more confident about communicating their ADAS knowledge to customers.

Note that service, body shop and parts staff are receiving information on ADAS maintenance and repair as part of their new product training. Bumper and windshield repairs, for example, now often involve the replacement or realignment of various sensors and cameras. And service advisors must know enough to advise customers how not to obstruct ADAS sensors and cameras with stickers, bike racks or aftermarket add-ons.

Educating Customers

A sales staff well-trained on vehicle ADAS features must learn how best to communicate that information to customers and prospective customers. One option is to make ADAS safety a selling point. Sales staff should be as excited about a vehicle's ADAS as they are about other design and performance features. The technologies, after all, are amazing. And engaged salespeople engage customers.

When prospective customers come in asking about particular models—and they will, because nowadays customers do thorough research before going to the dealership—dealership sales staff should be prepared to discuss ADAS features. In particular, they should be able to review which ADAS technologies come standard and which are available for optional purchase, alone or as part of a package.

Sales staff can augment vehicle walkarounds with print and digital material—whether produced by *MyCarDoesWhat*, your dealership or your OEM. *MyCarDoesWhat* offers all manner of resources, including videos, games, infographics and quick guides. In addition to reviewing ADAS features while on the lot or in the showroom, highlight them during test drives.

When communicating how ADAS features function, it is important not to exaggerate or overpromise. Descriptions should be accurate and consistent. Drivers with misplaced confidence in ADAS features might trust them too much and become less vigilant on the road. But drivers confused by ADAS features might not use them at all. Dealerships fortunate enough to have access to test tracks or protected routes for test drives can show how ADAS features work under safe and controlled conditions.

For customers unsure if they want to invest in certain optional ADAS features, arranging for a loaner or rental vehicle equipped with those features can seal the deal. And be sure to give links to manufacturer-specific information and *MyCarDoesWhat.org*.

Customers may well have additional questions after the sale. So once they learn how to pair their phones and use their GPS and entertainment systems, they might welcome an invitation back to the dealership for a refresher session. Schedule it a week or a month after their purchase. Make it convenient, easy, fun. Have refreshments, maybe door prizes. That session doesn't have to be a one-off, either. There is plenty of time post-purchase to provide customers with the hands-on training that lets them take advantage of all the technology that's in the car.

There's no better way to build brand and dealership loyalty than by providing excellent customer service.

In an interesting development, some dealerships are opting to segment the sales process so that salespeople devote themselves to selling, while technology experts do the teaching. This division of labor has the advan-

tage of playing to different strengths. In this scenario, "product specialists" receive intensive product training, which they use to demonstrate vehicle features, help customers choose options, and set up a new vehicle's technology. After customers leave the dealership, and as long as they have their vehicles, they can access an app or call a special hotline to get expert answers to any of their questions. Plus, they can attend a follow-up session at the dealership if they wish.

In another take on this idea, dealerships have hired tech-savvy teenagers to work with customers after the sale.

Product specialists, geniuses, product presenters, transportation consultants, technology specialists, tech-sperks—give these employees a title they can be proud of, and a way to climb the career ladder. One dealership starts new recruits as service greeters, and moves them up to the product expert ranks if their work habits and social skills show promise. Budding experts should receive intensive in-vehicle tutorials, and adequate in-person and online training before working with customers. Eventually they may become interested in learning how to sell or become service advisors.

One last word: Encourage customers to call with any questions they may have. Urge them to bring their cars in if something's happening that they don't understand, or if anything doesn't seem quite right. And train service advisors to talk about ADAS when customers bring their vehicles in for scheduled maintenance. Finally, consider running *MyCarDoesWhat* videos on a loop in showrooms and service department waiting areas. There's no such thing as knowing too much about driving safely.



Selected Bibliography

GOVERNMENT AND ASSOCIATION PUBLICATIONS AND WEBSITES

- Advanced Driver Assistance Technology Names.* American Automobile Association (AAA), Inc., January 2019.
- In the Driver's Seat: A Guide to Vehicle Safety Technology.* The Hartford Center for Mature Market Excellence, November 2015.
- Looking Forward: Vehicle Technology Preferences among Mature Drivers.* The Hartford and MIT AgeLab, June 2016.
- MyCarDoesWhat.org.* National Safety Council and The University of Iowa
- Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey, NHTSA, DOT, March 2018
- Personal Data in Your Car.* NADA and the Future of Privacy Forum.
- Reaching Zero Crashes: A Dialogue on the Role of Advanced Driver Assistance Systems.* National Transportation Safety Board, October 27, 2016 (transcript).
- University of Iowa National Consumer Survey of Driving Safety Technologies.* The University of Iowa.

ORGANIZATIONS WORKING ON VEHICLE SAFETY*

- AAA National
- AARP
- Advocates for Highway & Auto Safety
- Alliance of Automobile Manufacturers
- American Driver and Traffic Safety Education Association
- Association of Global Automakers
- Automotive Information Sharing and Analysis Center
- Center for Auto Safety
- Consumer Reports

- Future of Privacy Forum
- Insurance Institute for Highway Safety- Highway Data Loss Institute
- MCity, University of Michigan
- MIT AgeLab
- NADA
- National Conference of State Legislatures
- National Highway Traffic Safety Administration
- National Institute of Standards and Technology
- National Safety Council
- National Transportation Safety Board
- American Property Casualty Insurance Association
- SAE International
- The Hartford Center for Mature Market Excellence
- The National Advanced Driving Simulator
- Transportation and Vehicle Safety Policy Research Program, University of Iowa
- Transportation Research Institute, University of Michigan

*Not a comprehensive list

ARTICLES AND WHITE PAPERS

- "10 Automakers Equipped Most of Their 2018 Vehicles With Automatic Emergency Braking." IIHS, March 13, 2019
- Kulich, Eric. "BMW Store Uses Genius Program as Career Builder." *Automotive News*, April 2, 2018.
- Monticello, Mike. "Car Safety Systems That Could Save Your Life." *Consumer Reports*, June 25, 2019.
- Phelan, Mark. "These Car Features Could Prevent Your Next Crash." *Detroit Free Press*, June 8, 2019.
- Walsworth, Jack. "Dealership's Refresher Class Lures Buyers Back." *Automotive News*, November 20, 2017.
- Welch, Peter. "The Future of Personal Vehicle Ownership." NADA, April 9, 2018.

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