# ADAS Q&A WITH JOHN WARANIAK

## A Closer Look at Lateral-Collision Avoidance Systems

By Mike Imlay

■ Advanced lateral-collision and blindspot warning systems comprise just one of the more important new technologies in the emerging aftermarket category of "safety performance."

**While identifying multiple growth opportunities for the specialty-equipment industry, the recently released "SEMA Advanced Vehicle Technology Opportunities Report" (see p. 90) predicts specific growth potential in the area of lateral-collision avoidance systems. To better understand this advanced driver assistance (ADAS) technology, *SEMA News* turned to SEMA Vice President of Vehicle Technology John Waraniak.**

**SEMA News:** ***Can we briefly review the ADAS that fall under the lateral-collision avoidance umbrella?***

**John Waraniak:** ADAS lateral-collision avoidance features help drivers avoid hazards on either side of the vehicle. That includes both passive warnings and active systems that intervene with the vehicle's controls to keep it in a marked travel lane or help a driver avoid merging into a vehicle in the driver's blind spot. Passive lateral-collision avoidance systems simply warn the driver of an impending collision. Active systems help drivers correct the vehicle's position in the lane to avoid a collision.

Lateral-collision avoidance systems have increased in use since OEMs began offering ADAS technologies as optional features in 2011. There are several lateral-collision avoidance systems available on many of today's most popular vehicles that are customized and accessorized by SEMA members.

Because they are less complex, the passive systems are ideal for the aftermarket. They include lane-departure warning (LDW), blind-spot warning (BSW) and rear cross-traffic warning (RCW). LDW systems provide visual, audible or haptic warnings to alert drivers when they are crossing lane markings. BSW systems provide drivers with visual and/or audible notification of vehicles in lateral blind spots. The systems may provide an additional warning if you use your turn signal when there is a car next to you in another lane. RCW systems provide visual, audible or haptic notification of

objects or vehicles out of rear camera range but closing in from the sides.

**SN:** ***Even though the active systems are more the purview of OEMs, perhaps we should go over them as well.***

**JW:** Active lateral-collision avoidance systems include lane-keeping assistance (LKA), lane-centering assistance (LCA) and rear automatic emergency braking (AEB). LKA systems are a functional extension of LDW and provide automatic corrective steering input or braking when the driver unintentionally crosses lane markings. LCA systems continuously provide active steering to stay between lane markings and are constantly engaged with steering control systems to keep a vehicle centered in the lane. Rear AEB automatically applies brakes to prevent backing into something behind the vehicle. That could be triggered by the rear cross-traffic system or other sensors on the vehicle.

**SN:** ***What are the overall safety or driving benefits to consumers?***

**JW:** Nearly half of all fatal crashes are single-vehicle crashes in which the vehicle runs off the road. Simulations have shown that LDW could reduce run-off-road crashes by 30%. However, data from the Insurance Institute for Highway Safety (IIHS) suggests that LDW systems are not very effective and are often disabled by drivers. One reason is that many lane changes are made without the use of turn signals, causing the system to give a warning whenever a driver intentionally changes lanes.

BSW has been found to reduce insurance claims for property damage by 10%, and bodily injury by 15%. Consumer surveys indicate that BSW is one of the most favored ADAS technologies. That is likely because most BSW systems perform predictably and are unobtrusive.

JD Power recently stated that BSW systems are among the top safety features requested by consumers on new vehicles. IIHS data on RCW estimates the benefit of backup cameras and RCW to be helpful in preventing 17% of backup crashes. Increasing demand for those systems will help drive new opportunities for aftermarket entry participants.

**SN:** ***How do those systems work?***

**JW:** LDW technology components include cameras to identify lane lines; software processors capable of interpreting sensor data to warn the driver in time to avoid a collision; driver interfaces to provide visual, audio or haptic feedback; and integration with the vehicle's turn signals. BSW technology components include external side sensors that can be ultrasonic, radar, camera, lidar or a combination of those; ECU and software; and a driver interface for the warning that can be visual, audio or haptic. Key components of an LKA system include one or two cameras, an ECU with software processing capability, and integration with the vehicle's brake control and/or steering systems and turn signals.

**SN:** ***What is the growth potential for LDW and BSW systems in the aftermarket?***

**JW:** There is already a growing aftermarket for those systems and significant market potential. The aftermarket LDW market is worth $112 million today and is expected to be $185 million in 2021. There is already a strong aftermarket for BSW of nearly 100,000 units sold annually, representing more than $25 million in sales. That is expected to nearly double by 2021.

LDW products are often based on off-the-shelf camera technologies that are readily available to aftermarket product developers. As prices for cameras decrease and their performance capabilities improve, they are becoming more common aftermarket solutions. There may be additional opportunities for growth with targeted marketing of insurance companies and fleet businesses as well as providing consumers with customized and personalized options for innovative driver interfaces not available with OEM factory-equipped ADAS features.

Automakers often include BSW as part of high-end trim or an ADAS package, adding hundreds or even thousands of dollars to a vehicle's purchase price. Aftermarket suppliers can take advantage of providing upgrades, retrofit systems and custom warning interfaces at much lower costs.

**SN:** ***How complex are those systems to install or retrofit?***

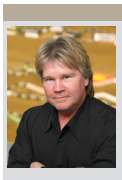
**JW:** Passive LDW and BSW systems require little integration into a vehicle's control systems, as opposed to active systems that require complex integration into the vehicle's electronics, software and control systems. The technology components of BSW systems are relatively simple; however, it may be an aftermarket challenge to add sensors and warnings to a previously unequipped vehicle in a way that is reliable and appeals to consumers and enthusiasts.

**SN:** ***What is the regulatory and/or liability climate surrounding those products?***

**JW:** There are no existing or proposed regulations for lateral-collision avoidance systems in the United States. BSW systems often use side-view mirrors for the driver interface warning light. Aftermarket add-on systems must take care not to modify mirrors such that the vehicle is taken out of compliance with applicable Federal Motor Vehicle Safety Standards (FMVSS) and regulations regarding rear visibility or other FMVSS regulations. It's important to note that OEM as well as aftermarket products deemed to have a safety-related defect are subject to the National Highway Traffic Safety Administration's broad recall authority.

**SN:** ***Is there a final takeaway you'd like to add for manufacturers and retailers regarding those systems?***

**JW:** Racing and performance innovations have long played a key role in making cars safer—from rearview mirrors, disc brakes and antilock brakes to crash data recorders and laser headlights. We are in a new era of vehicle safety performance. The industry focus includes not only reducing death and injury in collisions but also preventing a crash from happening in the first place. Safety features designed to avoid accidents are becoming increasingly common, driven by increased consumer demand. Lateral-collision avoidance and aftermarket ADAS safety performance systems are creating new business and product development opportunities for traditional as well as next-generation SEMA companies.



**John Waraniak leads SEMA's vehicle technology programs to connect members with cost-effective product-development and engineering resources, solutions and benefits.**