

## Advanced Driver Assistance Systems

The Maryland CAV Working Group met at MDOT Headquarters, on 10 August 2022. The primary theme of the event was Advanced Driver Assistance Systems (ADAS), and a number of demonstrations and conversations focused on the topic. There were two keynote presentations followed by a panel of industry experts weighing in on the issue, as summarized below.

### NOTABLE QUOTES

ADAS is not a substitute for a fully engaged driver.	<i>Bob Kazmierczak</i> <i>AAA Club Alliance</i>
We [NHTSA] want to increase the adoption and use of ADAS – but recognize that some consumers turn them off either because they don’t understand their value, or the warning systems are an annoyance.	<i>Dee Williams</i> <i>National Highway Traffic Safety Administration</i>
Many of these [ADAS] systems perform well at lower speeds and with more recognizable situations – but in edge cases they don’t always provide enough warning or driver monitoring functionality.	<i>Kristin Poland</i> <i>National Transportation Safety Board</i>
After a critical vehicle part has been repaired, will the sensor operate as it was when it left the showroom floor?	<i>Steve Dawson</i> <i>Hunter Engineering Company</i>
Camera-based driver monitoring systems kept drivers focused on the road 5x more than those with steering wheel driver monitoring systems.	<i>Bob Kazmierczak</i> <i>AAA Club Alliance</i>
88% of 2022 vehicles have a front facing camera tied to ADAS – in 2013 that number was 3.9%.	<i>Ed Sprigler</i> <i>SafeLite</i>

### SUMMARY POINTS

#### **Awareness and Education for ADAS is Important**

- ADAS provides great potential to reduce crashes
- A study by AAA Foundation estimated that ADAS has the potential to prevent a combined total of approximately 40% of all passenger-vehicle crashes [\[link\]](#).
- There remains great confusion over the naming/terminology of different systems – each automaker calls their ADAS features something different. A coalition of organizations created “clearing the confusion” campaign to try and agree on common terminology [\[link\]](#).
- NHTSA is currently half-way through an on-line media campaign to promote ADAS benefits and educate vehicle owners about these safety technologies [\[link\]](#).
- Education and awareness are critical, as many consumers either don’t understand their own car’s capabilities – or worse, they turn-off the features and don’t take advantage of them.

## **ADAS and Sensors are Rapidly Becoming Standard on Vehicles**

- ADAS started on vehicles in 2008, and in 2023 all new cars rolling off the assembly line will have AEB standard.
- 88% of 2022 vehicles have a front facing camera in the windshields tied to ADAS – in 2013 that number was 3.9%.
- For some commonly available cars, there are 10 different sensors just between the grill and windshield.

## **Sensor Calibration is Critical to Ongoing Performance of ADAS**

- After a critical vehicle part has been repaired – either due to crash or malfunction – will the sensor operate as it was when it left the showroom floor?
- Two types of ADAS Calibration – static (fixture in shop), dynamic (driving). For static, each OEM has different fixtures for calibration. For dynamic, can take 15+ minutes, can be impacted by weather, special tools may be required.
- Some sensors can't self-check and can't be adjusted without some reference or stimulation in front of it – thus they need both static and dynamic calibration.
- Has increased the complexity of simply changing windshields – many cameras mounted on rear view mirrors, so when you replace the windshield the sensor doesn't know you've moved it – must be recalibrated. Even if camera is mounted in headliner, changing the windshield can change the calibration.
- Consumers assume the technology will work – it's all about safety, education, and caring. In some use cases there is an alert that a sensor isn't working, but what's worse is if the vehicle thinks the sensor is functioning and it's not.
- There's a potential false sense of security for passenger vehicles and commercial motor vehicles with ADAS / crash avoidance systems that are not properly calibrated.
- While education of consumers is important, it is number 1 in repair facilities for both OEM and aftermarket world. We have to ensure the OEMs are providing information on the vehicles they are putting out, and all the aftermarket shops are as well; this info is essential for dealerships, repair facilities, and consumers.

## **Driver Monitoring Systems Increase Safety**

- Sensors are important, but driver attention could prevent additional crashes while ADAS is engaged.
- Two main types of driver monitoring systems today – steering wheel (hands on wheel) and camera (eye movement).
- No driver monitoring system is foolproof, but ADAS systems with DMS saw reduced driver distraction, earlier warning.
- AAA Did a study to evaluate the effectiveness of driver monitoring systems. Camera systems kept drivers focused on the road 5x more than those with steering wheel monitors. Camera systems are also harder to fool than steering wheel systems.