

Impact of Advanced Driver Assistance Systems (ADAS)

January 17, 2019

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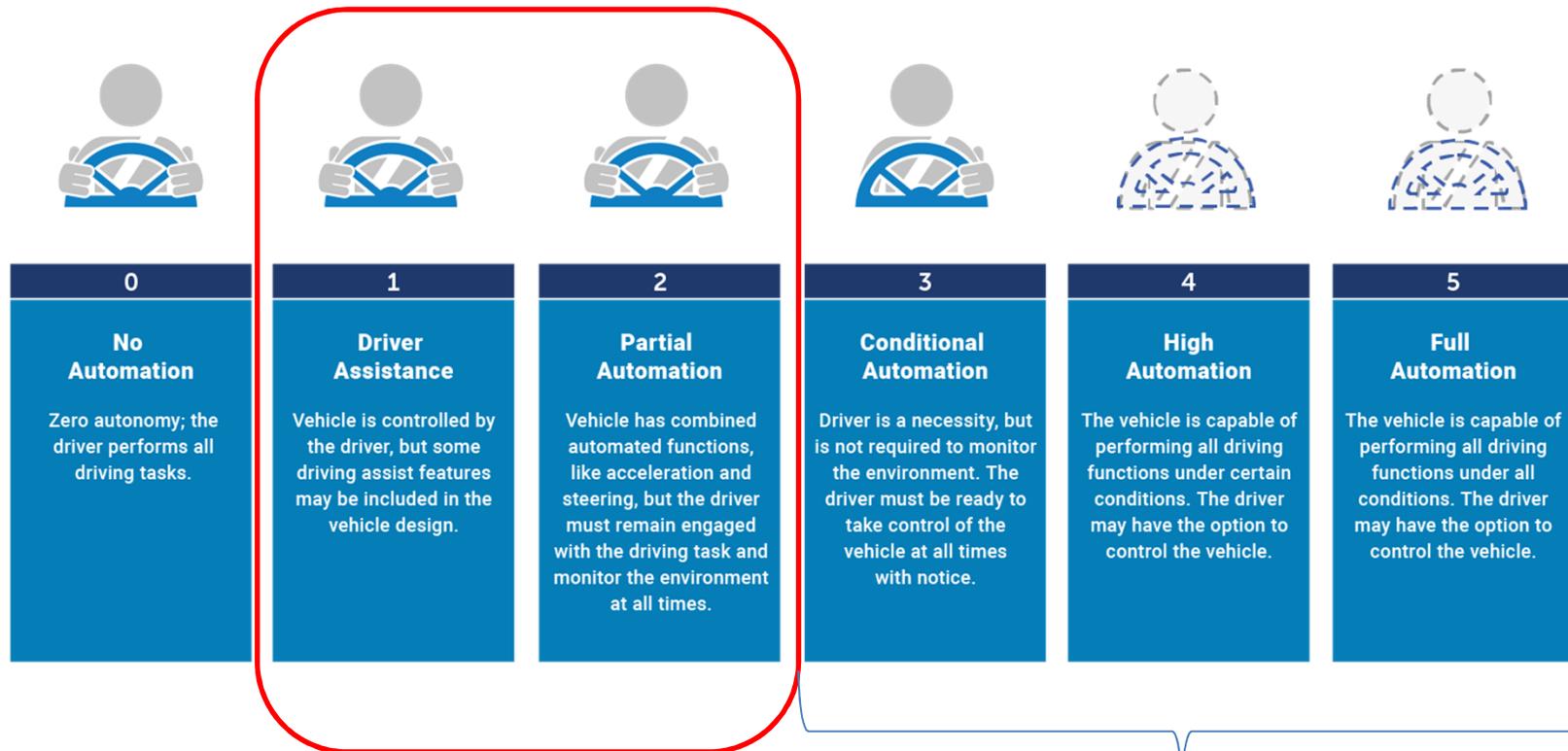
What is ADAS

- ADAS = Advanced Driver Assistance Systems
 - Blind Spot Monitoring (BSM)
 - Forward Collision Warning (FCW)
 - Lane Keeping Assist (LKA)/ Lane Departure Warning (LDW)
 - Automatic Emergency Braking (AEB)
 - Rear-cross Traffic Alert (RCTA)
 - Adaptive Cruise Control (ACC)
 - Fatigue warning systems
 - Curve-adaptive headlights
- Not a comprehensive list

Automation Levels

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS

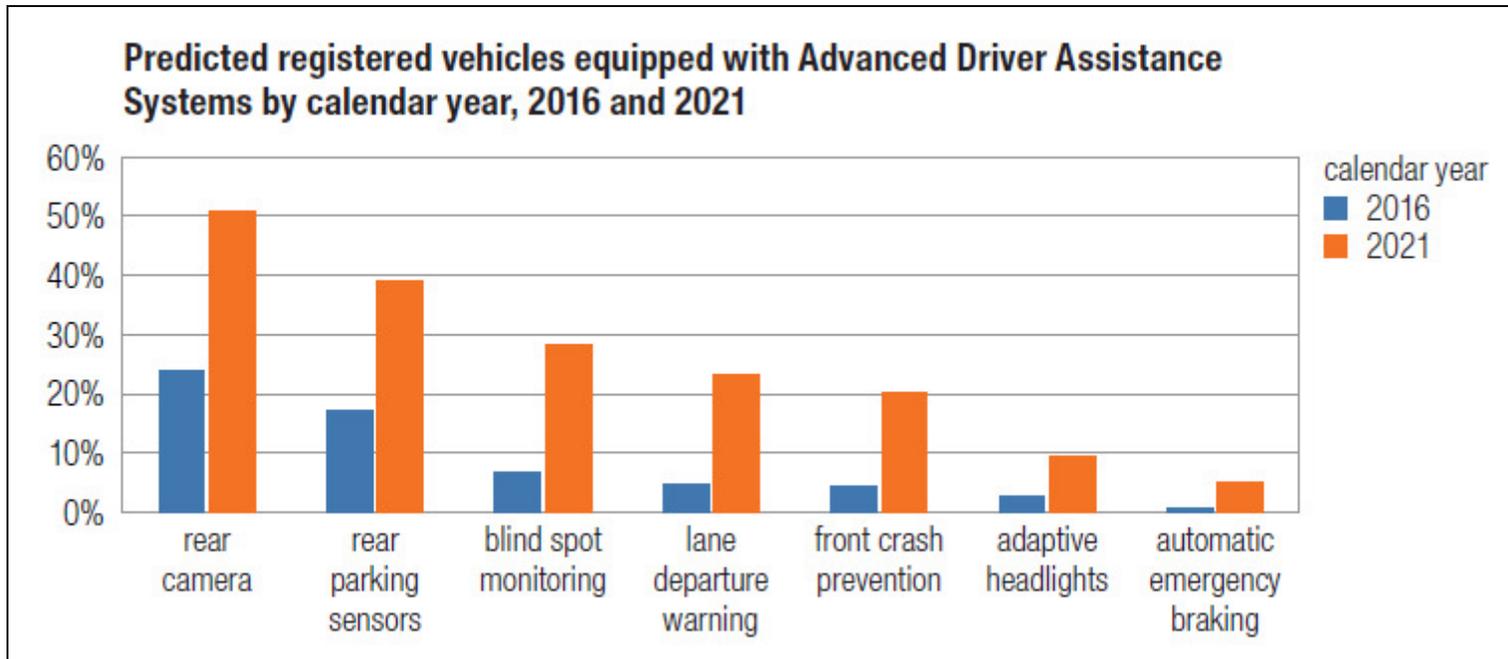
Full Automation



Advanced Driver Assistance System (ADAS)

Automated Driving System (ADS)

ADAS availability



Source: HLDI Bulletin: Vol. 34, No. 28

Regulation

- **Electronic Stability Control (ESC):** As of the 2012 model year, the federal government requires ESC in all cars, SUVs, pickups and minivans. Most new truck tractors are required to have ESC as of Aug. 1, 2017. The remaining types have until 2019.
- **Other ADAS features:** While there is no regulatory requirement for advanced features, 20 major automakers, representing 99 percent of U.S. light vehicle sales, have entered into a voluntary agreement with the National Highway Traffic Safety Administration (NHTSA) and IIHS to make front crash prevention systems standard on virtually all models by September 2022

Source: www.iihs.org

ADAS impact on safety

- The potential safety impact if ALL vehicles were equipped with ADAS is estimated to be substantial – up to a 40% reduction in crashes and 29% reduction in fatalities

	Crashes	Injuries	Deaths
Total Passenger-Vehicle Crashes	6,950,000	3,034,000	32,702
Potentially Preventable by FCW/AEB	1,994,000 (29%)	884,000 (29%)	4,738 (14%)
Potentially Preventable by LDW/LKA	519,000 (7%)	187,000 (6%)	4,654 (14%)
Potentially Preventable by BSW	318,000 (5%)	89,000 (3%)	274 (1%)
Total Potentially Preventable by All Systems Above	2,748,000 (40%)	1,128,000 (37%)	9,496 (29%)

Source: Benson, A., Tefft, B.C., Svancara, Austin M. & Horrey, W. (2018). Potential Reduction in Crashes, Injuries and Deaths from Large-Scale Deployment of Advanced Driver Assistance Systems. AAA Foundation for Traffic Safety.

ADAS impact on Frequency

In one recent report, mid-sized cars with crash avoidance systems had 14 percent fewer claims than identical vehicles without ADAS

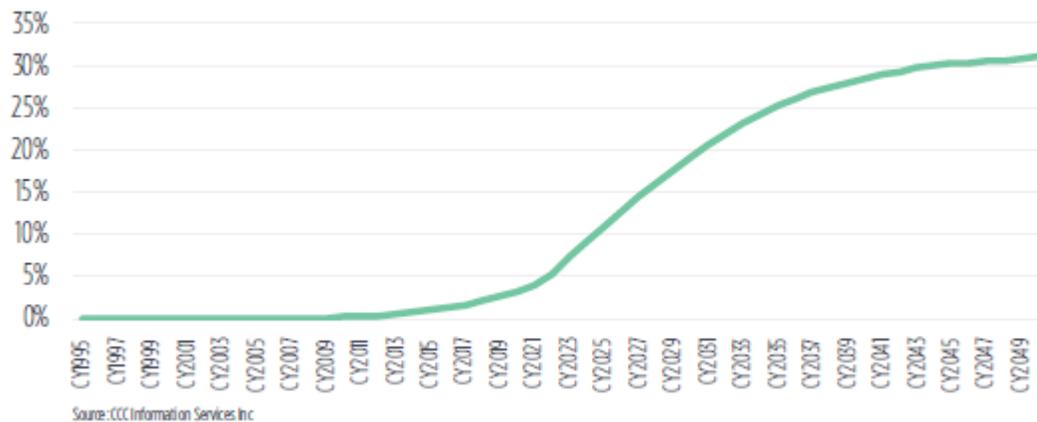
Forward collision warning	
▼ 27%	Front-to-rear crashes
▼ 20%	Front-to-rear crashes with injuries
▼ 9%	Claim rates for damage to other vehicles
▼ 16%	Claim rates for injuries to people in other vehicles
Forward collision warning plus autobrake	
▼ 50%	Front-to-rear crashes
▼ 56%	Front-to-rear crashes with injuries
▼ 13%	Claim rates for damage to other vehicles
▼ 23%	Claim rates for injuries to people in other vehicles
Lane departure warning	
▼ 11%	Single-vehicle, sideswipe and head-on crashes
▼ 21%	Injury crashes of the same types
Blind spot detection	
▼ 14%	Lane-change crashes
▼ 23%	Lane-change crashes with injuries
▼ 7%	Claim rates for damage to other vehicles
▼ 8%	Claim rates for injuries to people in other vehicles
Rear automatic braking	
▼ 62%	Backing crashes
▼ 12%	Claim rates for damage to the insured vehicle
▼ 30%	Claim rates for damage to other vehicles
Rearview cameras	
▼ 17%	Backing crashes
Rear cross-traffic alert	
▼ 22%	Backing crashes

Source: HLDI and IIHS study on the effects of crash avoidance features comparing rates of police-reported crashes and insurance claims for vehicles with and without the technologies. (May 2018)

ADAS impact on frequency (continued)

- As the number and % of vehicles with ADAS increases, it is expected to reduce the frequency of accidents

Potential decline in number of vehicles in accidents as ADAS feature adoption grows



ADAS impact on severity

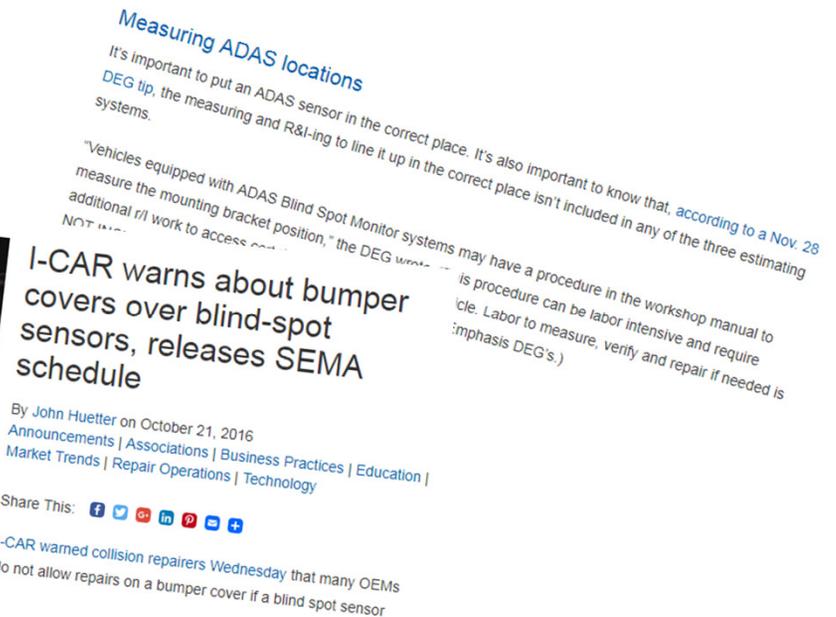
- Some ADAS features can lead to higher repair costs in the crashes that do happen. That's because sensors and other components are often located on the vehicle's exterior.
- **Repair procedures and parts:** These have become more complex and hence more expensive e.g. in the case of forward collision warning (FCW) without autobrake, average payment for damage to the insured vehicle goes up by \$109* .
- **Scanning:** Many manufacturers mandate/recommend pre and post repair scans for ADAS equipped vehicles.
 - These procedures to the cost of repair although the average cost has gone down from \$149 to \$90**.
 - They can also increase cycle time - not all shops have scanning equipment and need to get the scan done at dealers' locations.

*Source: IIHS/HLDI – “Benefits of crash avoidance technologies”

**Source:

ADAS impact on severity

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Combined impact

- The combined impact of lower frequency and higher severity is expected to be positive. In other words the reduction in claims will more than make up for the increased cost of repair.
- Data shows ADAS such as automatic emergency braking (AEB) is helping to reduce certain types of accidents such as front impact collision losses. And, when the accident is not prevented, ADAS systems help slow the vehicle before impact and mitigate the damage and subsequent cost of repair.
- In other cases, such as a rear impact collision loss (either the driver backing up into something or filing a rear-end hit to his vehicle with his own insurer), greater electronic content and more part components are leading to higher repair costs for ADAS-equipped vehicles.
- Clearly the technology will change the mix of claims and repairs in the future, but with fewer front end collisions, and accidents overall, carriers should see a decline in losses
- These effects will accelerate as ADAS features become more widely available
- Caveats:
 - Driver behavior may change with greater faith in ADAS features. There is a danger of greater distracted driving due to over-reliance on ADAS. (See 'Vehicle Owners' Experiences with and Reactions to Advanced Driver Assistance Systems' report from AAA foundation)
 - Vehicles equipped with effective collision avoidance features could also allow vehicles to persist longer in the vehicle fleet, slowing fleet turnover. This could lead to a slowdown in the change of the fleet from one with few collision avoidance features to one with more features.

Impact on Insurance Carriers

- **Rate:** Some of the benefits of ADAS features will have to be passed on to the policy holders in the form of discounts.
- **Product:** As ADAS features evolve, liability and coverage models may change. Advanced features such as automatic cruise control will lead to questions about driver versus manufacturer responsibility. Coverage may have to be split between the insurer and manufacturer.
- **Claims:**

