

Critical Areas in Advanced Driver Assistance Safety



Advanced driver assistance systems (ADAS) seek to alert a driver to critical events (e.g., forward collision warning) or even intervene (e.g., emergency braking, lane-keeping steering) to prevent crashes. These technologies, however, are not equally available across the passenger vehicle fleet [1], nor is there standardization in how their uses and limitations are conveyed to potential buyers [2], demonstrated at point of sale, or conveyed via owners' manuals [3]. While there is a growing body of research exploring drivers' expectations and trust in these technologies [4], there is a dearth of research into how these technologies are marketed and sold, the degree to which they are available by model and trim, and how consumers can locate information about ADAS in the buying process.

KEY QUESTIONS

This project used an exploratory and wide-ranging lens to examine the existing research and address gaps in how ADAS are marketed, sold, and included in post-crash data collection. These gaps may create a substantial safety risk if salespeople, drivers, and safety professionals have difficulty understanding the correct use and limitations of ADAS, and therefore undersell and underuse them. We examined the following research questions:

1. How are driver assistance systems marketed and available on different vehicles?
2. How are dealerships providing information about these systems to consumers shopping for a vehicle?
3. How are these technologies represented in crash statistics?
4. What tools do police have to account for these technologies in crashes, and what updates should be made to current tools?

CONCLUSION

This work revealed both concerning gaps and promising opportunities for better understanding, deploying, and regulating these technologies. Both consumers and safety professionals need to move quickly to keep up with the rapid proliferation of these technologies, which exposes the need for better data collection and potentially greater oversight and regulation of these technologies. Given the evidence that at least some of these technologies can provide safety-critical benefits, ensuring they are widely available in the passenger fleet and properly used requires understanding how they get into the hands of consumers and how and whether they "work." This research aimed to illuminate some of these issues and points the way toward multiple promising avenues for future research into these topics.

CRASH REPORT FORMS

The proliferation of ADAS has outpaced updates to current crash investigation forms. The National Highway Traffic Safety Administration's June 2021 Standing General Order requires manufacturers and technology companies to report fatal and serious injury crashes involving Level 2 and above ADAS and Automated Driving Systems (ADS). While this order signifies growing recognition that government policy and practices need better information about these technologies and their role in traffic safety, we lack updated guidance and policy for crash reporting forms. ADAS variables are not currently included in the Model Minimum Uniform Crash Criteria (MMUCC) guidelines and thus unlikely to exist on crash reports for most states. These gaps in data collection hinder researchers' ability to understand how ADAS is sold, demonstrated, used, and recorded in a crash.

[1] Voelk, "New Safety Features in Cars (or Just New to You)."

[2] Abraham et al., "What's in a Name."

[3] Boelhouwer et al., "How Are Car Buyers and Car Sellers Currently Informed about ADAS?"; Capallera et al., "Owner Manuals Review and Taxonomy of ADAS Limitations in Partially Automated Vehicles"; Oviedo-Trespalacios, Tichon, and Briant, "Is a Flick-through Enough?"

[4] Horrey et al., "Expectations and Understanding of Advanced Driver Assistance Systems among Drivers, Pedestrians, Bicyclists, and Public Transit Riders."