

March 30, 2021

National Highway Transportation Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Submitted via [Regulaiton.gov](https://www.regulaiton.gov).

Re: Docket No. NHTSA-2020-1016 Framework for Automated Driving System Safety

To Whom it May Concern,

Automated driving technology, which from an insurers perspective includes advanced driver assistance system (ADAS) and automated driving system (ADS) technology, is rapidly increasing automation of the driving function. As these innovations fundamentally change the nature of driving, property casualty insurers will have a key role to play in encouraging the safe and efficient introduction of advanced vehicle technology. To do so, insurers must have access to information and data to innovate and develop services, products, and pricing to support the new automotive technologies.

The American Property Casualty Insurance Association (APCIA) is the primary national trade association for home, auto, and business insurers. APCIA promotes and protects the viability of private competition for the benefit of consumers and insurers, with a legacy dating back 150 years. APCIA members represent all sizes, structures, and regions-protecting families, communities, and businesses in the U.S. and across the globe. Together, APCIA members write 54 percent of the automobile insurance in the United States.

APCIA appreciates National Highway Transportation Safety Administration's (NHTSA) efforts to develop a framework for the automated driving system (ADS) safety through this advance notice of proposed rulemaking (ANPRM). The document lays out a process for developing the framework, administrative and regulatory tools available for use, as well as some potential challenges ahead. While the document makes no direct mention of insurance, it does touch upon issues that are very important to APCIA members that write automobile insurance, including safety, information sharing, and appropriate oversight of automated driving system technologies.

The ANPRM asks for comment on 25 specific questions, while we do have some specific feedback from member companies on some of the questions that are attached to this comment letter, our comments will focus on the most important issues to APCIA members including safety, information sharing, and appropriate division of oversight of automated driving system technologies between the federal government and the states.

Prioritization of Safety: Updating FMVSS, Standard Terminology for ADS and ADAS Systems and Consumer Education

APCIA believes that safety standards applicable to automated vehicles must set clear expectations for the public and provide clear direction for technology developers and manufacturers for compliance.

As such, we believe that the existing Federal Motor Vehicle Safety Standards (FMVSS) should be updated to address vehicles with both automated driving systems (ADS) and advanced driver assistance technology (ADAS). APCIA also supports the concept of requiring manufacturers to submit self-certification of their technology and that that recall authority applies to these systems, as it does for conventional vehicles serving as the primary enforcement mechanism for the FMVSS.

APCIA believes that exceptions to existing auto safety laws and motor vehicle safety standards should be rare, limited to only the highest levels (i.e., fully autonomous) of automated driving and should clearly define the levels of automation to which the modification applies. Exceptions should not be made for collision protection standards.

APCIA strongly believes that there should be standardization of terminology used to describe both automated driver assistance (ADAS) and automated driving systems (ADS) used for highly automated or “self-driving” vehicles. Common terminology would also enable the public to have a clearer understanding of the technology and allow insurers to identify and differentiate systems by performance, a critical element for insurance product development and pricing. Standardized terminology would also facilitate education of the public on the proper way to use automated driving systems on an ongoing basis as the technology evolves should be a key element of any safety framework for automated driving systems and automated driver assistance systems.

Promoting Collaboration and Transparency: Data Access Standard and Data Elements

Access to and sharing of automated or autonomous vehicle data is a critical issue, not only for vehicle owners and insurers, but for automotive technology developers, manufacturers, vehicle owners and numerous other stakeholders. Safety, security, privacy, and protection of intellectual property are all important, but must be balanced with the need for third parties to access such data. At a minimum, vehicle owners or lessees should have the ability to authorize access to vehicle data to third parties with whom they wish to share data for any reason.

When determining liability in an auto accident claims situation, the primary approach today is to interview the drivers. With automated vehicles, insurers will need access to recorded vehicle data to provide evidence of how an accident happened. APCIA believes that our current state-based system of determining liability for accidents and compensating victims should be able to adapt to the changing nature of the driving risk, but only if vehicle data is accessible and in a form that allows for prompt accident investigation and resolution of claims.

The Comprehensive Plan continues to call for the private sector to identify opportunities for voluntary data exchange, but it’s becoming clear that manufacturers are reluctant to do so absent clear guidance on what their obligations are. Establishing a single set of rules for data access and sharing at the federal level, and a standardized set of data elements that balances the interests of all stakeholders is critical. One suggestion that APCIA supports is updating the current event data recorder (EDR) law to apply to automated vehicles with the department working with state motor vehicle regulators, and insurance regulators to develop a standard set of data elements.

Recognition of State Regulation of Insurance and Liability Issues

APCIA supports preservation of the current division of federal and state regulatory responsibilities for motor vehicles, with the federal government setting and enforcing safety standards for motor vehicles and recalls, setting requirements for large vehicles. The states should continue to have primacy on motor vehicle “rules of the road”, liability issues, insurance requirements and regulation, as they do today.

Conclusion

Automated driving technology holds great promise for the future, and implementing clear standards for safety, maintaining the current federal and state roles in regulating automated vehicle technology and ensuring that insurers have access to vehicle data on reasonable terms to efficiently handle claims, develop products and underwriting methods are an essential first step toward that future. APCIA and its members stand ready to assist the Department of Transportation and look forward to working together to establish a regulatory framework for automated driving.

Sincerely,

A handwritten signature in black ink, appearing to read 'Robt R', with a large loop at the end.

Robert Passmore

APCIA Member Responses to Questions Asked in ANPRM

Question 1: *Describe your conception of a Federal safety framework for ADS that encompasses the process and engineering measures described in this document and explain your rationale for its design.*

Response 1: As a preliminary note, we agree with NHTSA's statement that it "would use performance-oriented approaches and metrics that would accommodate the design flexibility needed to ensure that manufacturers can pursue safety innovations and novel designs in these new technologies."

The conception of a framework that promotes these performance-oriented approaches and metrics would involve 1) tracking of NHTSA's research on crash causation in passenger vehicles and large trucks to the technologies that both focus on the significant reduction of "critical reasons" for crashes and form the basis of ADS (i.e., forward collision-avoidance, lane-departure warning and lane-keeping assistance); 2) determining the incidence of ADS-caused error on the frequency and severity of crashes; and 3) developing metrics to compare the net impact human vs. ADS errors on the frequency and severity of crashes.

Because states retain the responsibility for licensing and establishing minimum financial requirements for vehicles operating on public roadways, it will be necessary for insurance companies to be able to clearly determine and quantify the favorable performance of ADS against that of humans. This would be especially critical in the period where safety operators are required to be present in the vehicle and the human driver is expected to have or regain control of the vehicle – regardless of whether that regain of control was discretionary or prompted by an ADS error.

Question 2. *In consideration of optimum use of NHTSA's resources, on which aspects of a manufacturer's comprehensive demonstration of the safety of its ADS should the Agency place a priority and focus its monitoring and safety oversight efforts and why?*

Response 2: NHTSA should verify that means to assess and monitor the reliability of vehicle hardware, i.e., sensors (cameras, lidar, radar), actuators and Vehicle-to-Infrastructure (V2I) systems exist – similar to the way in which the mechanical features of Level 0-1 vehicles are assessed. (Monitoring of sensor performance may be more relevant as OEMs look to test vehicles on public roads and may become an element of vehicle maintenance in commercialization scenarios.)

Alternatively, NHTSA should be able to determine whether the likelihood of ADS failure resides more with "hardware" or systems that capture the inputs on which Planning, Perception and Control rely. Once this determination is made, NHTSA could then determine how to allocate resources between hardware and software safety and determine where system redundancies may be most needed. In the case of software performance and cybersecurity, it would be helpful for NHTSA to:

- Provide the public with an understanding of the kinds of software updates/modifications that a manufacturer could self-correct, the frequency of any anticipated updates and any modifications or corrections that might be considered analogous to a product recall. Similarly, depending on the severity of the modification (i.e., involving a safety-critical component or failing in a documented crash context) and in the spirit of the transparency principles related to the AV TEST initiative, NHTSA should set out the processes to which the corrected ADS/software was subjected prior to redeployment.
- Establish and publish best practices around encryption and verification of communication channels; security redundancies for critical systems and functions; and the limitation of communication between critical systems.

Question 3: *How would your conception of such a framework ensure that manufacturers assess and assure each core element of safety effectively?*

Response 3: The value proposition for ADS and Autonomous Vehicles has long been that they will be safer than human drivers – once fully autonomous. The statistic that is often-cited (purportedly based on NHTSA data) is that 94% of crashes are due to human error. While a more accurate way of phrasing this is that 94% of crashes involve a form of human involvement in a critical pre-crash event, the point is that ADS must target critical pre-crash events and reasons caused by humans, and, in correcting these situations perform measurably better than human drivers – or achieve that enhanced performance over a defined period of time. As a corollary to this, where measurable safety improvements are not achieved over a defined period, NHTSA should position itself to assist manufacturers and AV actors in (re)directing R&D efforts to produce expected safety results.

The conceived-of framework would allow manufacturers to focus on the critical pre-crash events and reasons that most frequently cause crashes or result in the severest losses. This, in turn, would allow a refinement in the categorization of ADS features and a “truer” determination of what is critical to safety – and therefore, requiring closer oversight -- in the progression to Level 5 Autonomy. For example, according to the 2008 FMVCS Report to Congress, the critical crash reason in 22.2% of the sample cases was the vehicle traveling off the edge of the road, and in 10.8% of the cases it was crossing outside its lane. This would suggest that the continued development of lane-keeping assistance and lane departure warnings are likely to have a positive incidence on a significant risk factor. Conversely, supposing that camera/sensor technology were to focus on adjusting to either dimming or brightening ambient light, the safety impact may be considerably less, given that according to the same report, 71% of accidents occur in daylight, and the difference between dawn and dusk accidents is 0.8% (3.4% to 2.6%). While it may ultimately be necessary for cameras to adjust to lighting changes for full autonomy, in the shorter term, it will likely be more effective in reducing crashes to focus on lane departures. Further, showing measurable safety progress is likely to promote the public trust and acceptance in ADS.

Finally, the conceived-of framework would tend to promote collaboration between NHTSA and manufacturers, similar to the AV TEST initiative and better inform the administrative mechanisms that may be necessary and change throughout the technological development process.

Question 4: *How would your framework assist NHTSA in engaging with ADS development in a manner that helps address safety, but without unnecessarily hampering innovation?*

Response 4: Tracking NHTSA crash causation research to the technological advances would allow the prioritization of safety-critical technology that overlaps with autonomy over other technologies that may differentiate one manufacturer from another. In positioning itself to reorient AV actors' efforts that do not yield expected safety results, NHTSA would also be positioned to understand where the greatest shortcomings and development risks reside. As such, NHTSA (and any partner agencies) could identify the areas where consistency and interoperability of systems provide greater value for the entire nascent sector. Innovation would be promoted but channeled toward the ADS value proposition of reduced human error and increased safety, while lessening the potential for unforeseen risk shifts through the complexity/variety of systems.

Question 5: *How could the Agency best assess whether each manufacturer had adequately demonstrated the extent of its ADS' ability to meet each prioritized element of safety?*

Response 5: NHTSA could work with manufacturers to determine minimum specifications for sensor range, resolution, performance under atmospheric conditions etc. with a view to assuring the quality of data on which the other core safety elements are based. NHTSA could then work with states with respect to the licensing of ADS testing on public roads and the standardization of reporting using the classification of “planning, perception and control,” as well as voluntary “disengagement” by the human driver/safety operator for discretionary reasons. While there is likely to be overlap among safety elements, the idea behind using a common classification framework (and nomenclature) would be to locate and correct the “principal” vulnerability.

Separately, NHTSA may consider avenues like:

- Conducting additional research on the marginal safety gains achieved by ADS successfully testing on closed tracks before testing on public roads. Currently, states typically require that operation of the test vehicles be insured to conduct public road testing. However, insurers have few means of assessing the relative safety of the ADS or its purported capabilities. Knowing that the ADS had met certain milestones would be one way of gauging its relative safety.
- Coordinating with other federal agencies like the FAA, NIST and NASA to better understand the impacts of cybersecurity-induced interruptions of autonomous systems in their respective contexts.

Question 6: *Do you agree or disagree with the core elements (i.e., “sensing,” “perception,” “planning” and “control”) described in this document? Please explain why.*

Response 6: The core elements are sufficiently comprehensive to address the data inputs, processes and outputs necessary for decision-making by the ADS to execute the main driving functions of acceleration, braking and steering.

Question 7: *Can you suggest any other core element(s) that NHTSA should consider in developing a safety framework for ADS? Please provide the basis of your suggestion.*

Response 7: Dependent on whether a manufacturer has chosen to pursue autonomy through incremental gains in Advanced Driver Assistance Systems vs. have humans remain passengers – ensure that the transition of control between human driver and ADS enables the former to override any ADS malfunction, including those induced by cybersecurity incidents.

Question 8: *At this early point in the development of ADS, how should NHTSA determine whether regulation is actually needed versus theoretically desirable? Can it be done effectively at this early stage and would it yield a safety outcome outweighing the associated risk of delaying or distorting paths of technological development in ways that might result in forgone safety benefits and/or increased costs?*

Response 8: NHTSA might consider undertaking additional research on the extent of availability and presence of ADS-related elements in domestic automobiles operating on public roadways that would be necessary to having a measurable incidence on documented crash causation. It could also consider working with states to set thresholds/ceilings in terms of time for any spikes in crashes attributable to technology during a transition from one SAE autonomy level to another. For example, if, over a X month period of permissible testing on public roads within a state, there were an increase in the number of reported crashes involving ADS reported, NHTSA could prescribe or recommend a return to closed-track testing. This, of course, would also involve working with states on reporting requirements for ADS testing, including when crashes occur.

Question 10: *Which safety standards would be considered the most effective as improving safety and consumer confidence and should therefore be given priority over other possible standards? What about other administrative mechanisms available to NHTSA?*

Response 10: With respect to what may be effective in terms of bolstering consumer confidence, the manner of any testing or integration of ADS-enabled vehicles on public roads may go as far or farther than the technology’s ability to meet an established standard whose metrics may not be commonly understood. Thus, consistent with Response 5, knowing that vehicles had first been tested on closed tracks for up to X hours, or publicly at speeds no more than X, before testing or driving in congested but higher speed environments, may promote consumer confidence.

Question 12: *What types and quanta of evidence would be necessary for reliable demonstrations of the level of performance achieved for the core elements of ADS safety performance?*

Response 12: Provided that sufficiently clear definitions of errors of the core safety elements – or clear means of attributing regain of human operation of the vehicle to causes other than discretionary operator action -- could be developed, it seems that disengagements per mile is a good starting point. Review of California DMV reporting data for the 2018 and 2019 reporting periods tends to show, however, that there is a lack of harmonization, and disengagement reasons can be anecdotal. For example, in the 2018 reporting

period, a testing licensee might include as a disengagement the conclusion of a specific test, while another might report that the human driver elected to regain control to give wider berth to a cyclist in a bike lane. In that second instance, it is unclear whether the driver acted conservatively out of mistrust of the ADS, or whether he or she recognized the presence of the cyclist before the ADS and consequently chose to act in the delay prior to the ADS reaction. The California DMV changed its reporting format in subsequent years, but it did not appear to have adopted standard definitions and coding to errors of planning, perception and control.

Question 13: *What types and amount of argumentation would be necessary for reliable and persuasive demonstrations of the level of performance achieved for the core functions of ADS safety performance?*

Response 13: Some public resistance to ADS may be due not only to concerns over inadequate safety but also to the infrastructure needs for ADS to become widespread. While questions of “vehicle-centric” urban planning and attendant costs may be outside of NHTSA’s remit, it may be useful for NHTSA to distinguish between infrastructure that builds in a level of redundancy that enhances ADS operating safety vs. infrastructure that might be required to enable widespread ADS operation. Alternatively, NHTSA may be in a position to clarify that as part of achieving SAE Level X autonomy, ADS must be capable of executing certain functions independently. For example, a Level 3 ADS-equipped vehicle must be able to gauge distance of multiple lanes of oncoming traffic to turn left at an unprotected light without relying on left-turn assistance built into any traffic signaling equipment at a given intersection.