



September 19, 2022

Ann Carlson
Acting Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

RE: Agency Information Collection Activities; Notice and Request for Comment; Drivers' Knowledge/Correct Use of New Technology Features in Passenger Vehicles [Docket Number: NHTSA-2022-0063]

Dear Acting Administrator Carlson:

The Alliance for Automotive Innovation (“Auto Innovators”) appreciates the opportunity to provide comments in response to the July 20, 2022, National Highway Traffic Safety Administration (NHTSA) (“the Agency”) request for comments (RFC) on research to evaluate drivers’ knowledge of new technology features in passenger vehicles. Auto Innovators is the singular, authoritative, and respected voice of the automotive industry, representing motor vehicle manufacturers responsible for nearly 98 percent of cars and light trucks sold in the U.S., original equipment suppliers, technology companies, and others within the automotive ecosystem. Accounting for roughly one-fifth of annual automotive R&D investment globally, the U.S. continues to lead in bringing the next generation of breakthrough automotive and mobility technologies to the market. Some of these technologies – including connectivity, electrification, and automation – have incredible potential to improve vehicle safety, reduce emissions, increase transportation equity, and grow the U.S. economy. Auto Innovators and its members are committed to a cleaner, safer, and smarter transportation future.

Consumer awareness on the capabilities and limitations of new technology is critical, particularly as new Advanced Driver Assistance Systems (ADAS) systems are introduced into the marketplace to provide either momentary intervention, or sustained driver support in performing the driving task. Vehicles equipped with SAE Level 2 (L2) automated vehicle features provide benefit to the driver by assisting with the driving task and reducing the potential for human error that could result in a crash.¹

Auto Innovators has been proactive in its efforts to support the introduction of emerging technologies. We are supportive of efforts such as the *Clearing the Confusion* initiative to define consistent ADAS nomenclature and terminology for advanced safety features.² In addition, with the increased availability of L2 systems, Auto Innovators developed Level 2 Driver Monitoring Principles that address several key areas,

¹ SAE J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles, SAE International, April 30, 2021

² CLEARING THE CONFUSION: Recommended Common Naming for Advanced Driver Assistance Technologies <https://www.sae.org/binaries/content/assets/cm/content/miscellaneous/adas-nomenclature.pdf>

including consumer information for L2 systems, providing driver monitoring as a standard feature, criteria for driver warnings, and approaches for reengaging the driver.³

In general, we are supportive of the agency's efforts to evaluate how L2 systems are being used by consumers in the field and the importance of research in ensuring a data-driven approach to policy. However, as outlined below, we have developed a series of recommendation to enhance the quality, utility, and clarity of the information to be collected.

Vehicle specific driver training to ensure understanding of system capabilities and limitations

In the RFC, NHTSA indicates that participants will receive "a two-hour training about the L2 systems." It is important that participants are educated on the features of the L2 vehicle they have been assigned, how it operates and also, critically, the limitations of the system. However, the amount of time suggested by the agency is neither realistic nor representative of the level of training or information that customers typically seek or receive under real world conditions.

It is important to ensure that any risky behaviors are correctly classified, and training is essential to minimize misclassification of driver actions that stem from a fundamental misunderstanding of the L2 system capabilities (e.g., drivers may be under the impression that the level of automation of their vehicle is higher than it actually is and believe certain activities are more acceptable). This helps ensure that any negative observed behaviors (based on retrospective analysis of naturalistic data) can be more accurately classified as intentional (or knowing) misuse, and not simply attributable to misconceptions about the system features and functionality. However, this does not require two hours of training and can likely be achieved by providing the same level of basic information regardless of the specific system that each participant assigned. This will also help reduce the overall study burden.

In either case, we recommend NHTSA leverage and reference any manufacturer materials for the specific vehicle the participant will be using during the study. The aforementioned training should include a review of the warnings that the L2 system may issue and what each warning means. Furthermore, any planned drives should be selected considering the ODD of the systems selected.

An additional research question that the agency may seek to address as part of this study (or a follow-on study), would be to evaluate whether higher levels of training impact driver behavior and how they interact with L2 systems both in the presence and absence of DMS (Driver Monitoring Systems). However, there may be challenges in ensuring a large enough sample size for meaningful comparison as part of this analysis.

Study considerations when comparing different L2 systems

There are a wide variety of L2 systems available on the market, each with different capabilities and defined areas of operation. For example, while some systems are simply a combination of ACC and Lane Centering Assist, other systems may also incorporate different driver monitoring technologies or strategies to assess the state of the driver and potentially allow the use of hands-free driving. Other systems may only operate

³ Auto Innovators Announces Driver Monitoring Safety Principles – April 27, 2021 <https://www.autosinnovate.org/posts/press-release/auto-innovators-announces-driver-monitoring-safety-principles>

hands-free under certain speeds and on certain road types. Even within a single vehicle, the behavior of the L2 system may change depending on the ODD.

To account for these variations, NHTSA should ensure a limited, yet reasonably representative number of different make/model vehicles are selected for use in the study. The goal should be to maximize the number of models selected, while also minimizing study variability and ensure that reasonable comparisons can be made between driver's responses to different types of systems or features. We suggest the agency select representative vehicles among the following categories: hands-free; hands-on with camera DMS; hands-on without camera DMS.

Similarly, it will be important that the final report acknowledge any potential bias or limitations based on the number (and design characteristics) of vehicles selected for testing, particularly when comparing different technology approaches as the findings of this study could unintentionally constrain future design concepts. The report should also acknowledge differences in specific DMS/HMI design (e.g., alert strategy, alert timer) and system performance (e.g., how well the vehicle holds the lane position, how frequently the system disengages), as these components could impact driver behaviors.

Depending on the vehicles selected for the study, the analysis could also provide potential insights on the use of in-vehicle cameras, as well as other sensing methods, to detect driver disengagement in Level 2 vehicles. Such research could assess whether cameras are as effective or more effective than non-camera monitoring systems in detecting driver engagement across a range of L2 features. We caution the agency against over-generalizing effects of camera DMS across all L2 systems. Depending on system performance and intended use, a camera-based DMS may have different effects compared to a non-camera DMS, and may also vary depending upon how the system is designed to interact with the driver. Without a careful control of all other aspects of the systems, drawing conclusions of the effectiveness of a camera DMS is difficult. Therefore, we strongly recommend that any conclusions carefully consider each L2 system within the context of its specific DMS/HMI as a whole.

Classifying safety related behaviors

NHTSA notes that it will be assessing "safety-related behaviors such as distracted driving and seat belt use." Certain systems, such as the hands-free systems referenced above, allow a driver the free use of their hands, which may traditionally be considered a form of physical distraction. Any distraction assessment should specify what type of distraction was measured (visual, manual, or both) and provide context with regard to the operating status of the L2 system. These observable behaviors should also have objective and measurable criteria to ensure they are accurately classified across all study participants. The study should also seek to evaluate whether there are differences in various strategies for reengaging the driver based on the number of warnings and warning types that can best hold the driver's attention in the specific situation in which they are communicated, and whether there are other factors that impact a driver's response to a warning or instances of potential misuse.

Accounting for variability in driver experience

The agency states that "Of the 180 selected drivers, 60 will be age 70 and older, 60 will be between the ages of 35 and 55, and 60 will be between ages 18 and 25." Given that the level of driver experience within the 18–25-year-old age category could vary significantly (e.g. 0-7 years of driving experience), we suggest



that the agency also capture data on whether prior driving history or previous experience with ADAS technology (e.g. in their personal vehicle) might impact observed interaction with an L2 system. NHTSA may also consider recruiting some existing owners of vehicles with L2 systems.

Additional considerations

The RFC notes that “half the participants will complete a 15-minute questionnaire that measures knowledge and opinions before exposure to L2 systems and the other half will complete the questionnaire after exposure with an estimated burden of 45 hours.” We urge the agency to reconsider this approach and instead provide questionnaires to all participants both before and after exposure to the L2 system. If structured correctly, the responses to such a survey could provide some insights to help inform the development of effective ways to communicate with the public on this important issue. While this recommendation will likely add some additional burden to this information collection, the additional data may be necessary to more definitively compare changes in consumer attitudes based on real-world experience. If there are limited resources for conducting additional questionnaires, we recommend that the half of participants that receive the survey before exposure, also be the ones to receive the survey after.

Please contact me if you have any questions on any aspect of these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Schmidt". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Scott Schmidt
Vice President, Safety Policy
Alliance for Automotive Innovation