January 19, 2022

Dr. Cem Hatipoglu
Associate Administrator, Vehicle Safety Research
National Highway Traffic Safety Administration
1200 New Jersey Ave, SE
Washington, D.C., 20590

RE: Announcement of Public Meeting; NHTSA 2021 Safety Research Portfolio Public Meeting [Docket Number: NHTSA-2021-0060]

Dear Dr. Hatipoglu,

The Alliance for Automotive Innovation ("Auto Innovators") appreciates the opportunity to provide comments in response to the National Highway Traffic Safety Administration's ("NHTSA") announcement and request for comment on the information presented during the NHTSA Safety Research Portfolio Public Meeting: Fall 2021 on October 19-21, 2021.

Auto Innovators is the singular, authoritative, and respected voice of the automotive industry, representing motor vehicle manufacturers responsible for nearly 99 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.

NHTSA research is fundamental for ensuring an effective and data-driven rulemaking process, and also helps inform the development of policies and programs aimed at improving roadway safety. Auto Innovators appreciates the work done by the agency in organizing the Fall Research Meeting and recognizes the efforts of staff in providing a comprehensive overview of the ongoing research efforts underway across a broad range of safety topics. It is important that NHTSA continue to build upon these efforts. An open and transparent process provides an opportunity for stakeholders to provide constructive feedback to help enhance the robustness of the agency's research efforts. We urge NHTSA to schedule similar briefings on a semi-annual basis (or at a minimum, continue annually) in order to provide periodic updates on key research milestones.

The automotive industry is in the midst of a transformative change that is redefining mobility. We are encouraged that the agency is engaged in a broad range of research activities, which include the evaluation of both established and emerging safety issues including vehicle crashworthiness, crash avoidance, cybersecurity, human factors, and automated driving systems (ADS). As manufacturers, suppliers, and technology companies develop innovative, cutting-edge technologies in each of these areas, it is critical that NHTSA keep pace with these advancements to help ensure safe and timely deployment.

1 General Recommendations on NHTSA's Research Program

Research is essential for ensuring a modernized approach to policy that supports the deployment of new technologies, and we urge the agency to leverage the additional resources made available to the agency through the Infrastructure Investment and Jobs Act to expeditiously address outstanding questions that may limit consumers access to life-saving safety systems.

Given the importance of research in supporting NHTSA rulemaking activities, we recommend that in addition to periodic research briefings, the agency also publish a combined Research and Rulemaking priority plan (with opportunity for notice and comment). Such a plan would help highlight key research activities, expected timeframes for completion, and ongoing research efforts support anticipated rulemaking actions in future. While we recognize that research milestones can be subject to change, it would be helpful to have a clearer picture of the outstanding activities and questions that the agency is seeking to address, and these might impact the timing of regulatory actions or updates to the New Car Assessment Program (NCAP). Ongoing regulatory uncertainty create significant challenges that can stifle investment in the development, production, and introduction of new technologies, particularly when existing regulations may limit the deployment of new vehicle designs and systems that are being made available in other parts of the world (e.g., advanced lighting).

This is even more imperative with respect to the deployment of highly automated vehicles (AVs), where additional research may be needed to inform rulemaking efforts to address regulatory barriers, or ensure suitable compliance options are made available for vehicles equipped with ADS. We urge the agency to work expeditiously to address these potential research gaps in order to promote further investment in these advanced safety technologies, and maintain U.S. leadership in advancing AV technology.

Furthermore, ongoing research efforts should be aimed at ensuring greater harmonization with recognized international standards because unnecessary or seemingly inconsequential differences between regulatory requirements (and related test procedures) can have a significant impact on both product development cycles, and the ability of consumers to have affordable access to new vehicle systems. This is particularly relevant as the agency considers updates to FMVSS to include requirements for pedestrian protection (GTR 9), advanced lighting, new anthropometric test devices (ATDs), and Automatic Emergency Braking (AEB) with Pedestrian AEB, among others, as well as how these interact with existing agency guidance, for example on cybersecurity. Ensuring consistent communication with international partners on both ongoing and emerging research will also help ensure greater alignment, and inform a more consistent approach to regulation and consumer information programs worldwide.

Finally, we encourage the agency to ensure that research is published in a timely manner once completed. This provides an opportunity for the findings to be reviewed by the safety community prior to any rulemaking action. While we recognize that this may not be possible in all cases, providing such opportunities helps ensure that the agency can develop more robust policy proposals that consider all relevant public input. The October public meeting provided a robust snapshot of the ongoing activities within the agency, and we look forward to reviewing the complete findings of these studies in future.

2 Additional Comments on Research Briefing Sessions

The following section provides high-level comments in response to the research presented during the various briefing sessions from the public meeting. While these comments do not address all of the topics that were covered across the three-day workshop, we will likely continue our review of the presentations and may contact the agency periodically as questions arise.

2.1 Advanced Driver Assistance Systems Research

- ADAS Tests Performed with Additional Actors – This research was focused on understanding the impact of adding further complexity to various precrash scenarios for assessing ADAS technologies. Auto Innovators recommends that future assessments are based on scenarios identified using real-world data.
- Driving Automation Level 2 Event Classification – This research seeks to develop a method for categorizing events observed during periods of Level 2 driving automation. While we recognize that NHTSA evaluated systems operating inside and outside their operational design domain (ODD), it may not be suitable to compare overall vehicle performance in various driving routes without making a distinction on whether the ADS was active or operating outside its ODD. We would encourage NHTSA to review other ongoing initiatives concerning Level 2 systems as it continues its research in this area.
- NHTSA's Heavy Vehicle Crash Avoidance Test Track Research - We urge NHTSA to continue its research on commercial vehicle ADAS technologies.

2.2 Human Factors Research

- Transition of Control and Post-Transition Driver Performance in L3 Vehicles – It would be helpful to understand whether NHTSA's research shows a change in subject response time after being exposed to several requests to intervene (RTIs) over time. For example, is there a tendency for the driver's response time to become longer or shorter after several RTI experiences?
- Older Drivers and Rearview Video Systems: An Update – It would be helpful if the final research report evaluated RVS effectiveness in additional scenarios such as "another car approaching from side," and whether the data suggests an optimal RVS camera angle? Future research should consider the evaluation of the effectiveness of multiple camera systems that provide enhanced views around the vehicle (e.g., birds-eye-view)
- Drivers Use and Adaptation to L2 Driving Automation – This research appeared to focus heavily on the negative impacts and potential misuse of L2 systems. We encourage the agency to also evaluate the positive benefits that are attainable during normal use conditions, including reduction in driving burden, decreased driver fatigue, and ability to better monitor the driving environment. This information would be helpful in further improving the designs of L2 systems.

2.3 Automated Driving Systems (ADS) Research

- Review of ADS Metrics Research – We encourage NHTSA to align more closely with ISO 34502 (*Road vehicles — Scenario-based safety evaluation framework for Automated Driving Systems*) for future Principal Other Vehicle (POV) performance assessment.

- Refining Testable Cases and Scenarios for Evaluating ADS L3 – L5 Concepts – Similar to the previous comment, we encourage NHTSA to align with ISO 34502 for future POV performance assessment.

2.4 Vulnerable road users

- Pedestrian Crashworthiness – Modeling and Predicting Head Impact Time – It would be helpful if NHTSA could provide additional background on how the agency anticipates pedestrian crashworthiness will be evaluated for systems with active hoods or other passive countermeasures that may positively impact crash outcome. We also request that NHTSA provide additional clarification on why the existing test procedures do not provide an appropriate means to account for this proper timing of the hood activation and deployment, relative to the head or motion.
- Pedestrian AEB Night Testing Method Research – NHTSA has indicated that it intends to review thermal imaging and LIDAR as part of ongoing research in 2022. While it may be possible to use cutting-edge technology, the agency should also consider more widely available technology in the market (including systems that integrate both single and multiple sensors).

2.5 Alternative Fuels Research

Generally, it is important that NHTSA efforts in support of potential regulatory test procedures be supported by field experience, and that research is aimed at developing a reasonable, practicable set of corresponding test procedures. The regulation and test procedure should also be technology neutral so as not to restrict potential future designs or exclude new and more robust test/trigger methods in future.

We urge NHTSA to explore options where technical documentation can be provided as a means of demonstrating compliance with any proposed test regulations procedure. Given the challenges in developing a reliable test procedure, a focus on detection and mitigation approach as one of the effective safety measures may be more practical in the near term. Therefore, mirroring the documentation approach according to GTR20 should be considered as an alternative.

In developing a Thermal Propagation (TP) test for use within regulation, the following aspects should be taken into account and evaluated as part of the agency's ongoing research:

- Test object: Test object should be based on either the "complete vehicle" or a "complete Rechargeable energy storage system (REESS)" (including BMS, thermal management, etc.). REESS subsystem (i.e., battery pack, module) should also be allowed if the representativeness can be demonstrated by the manufacturer.
- Initiation method: In general, the trigger method should represent and simulate cell internal issues leading to single cell thermal runaway and not correspond to the worst case in forced TP by external energy. For practicality of the development and certification by the manufacturer, alternative initiation method should be allowed if the single cell thermal runaway satisfying the specified conditions could be initiated. This alternative should be manufacturer's discretion. (Availability of documentation option will be a prerequisite.) For Pass judgement with no occurrence of thermal runaway, the initiation procedure should be well defined so that it could be conducted by the test laboratories independently from the manufacturer.

- Pass/fail criteria: The pass/fail criteria for thermal propagation tests such as explosion and fire containment for certain duration (e.g. maximum [5] minutes.) as well as judgement and measurement of smoke or gaseous emission (if required) should be defined clearly for each test constellation.