Mr. Steven Cliff
Acting Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Date: April 1, 2021
Subject: Framework for Automated Driving System Safety
Docket No. NHTSA-2020-0106 Published in the Federal Register on December 3, 2020

Dear Dr. Cliff

This letter provides Hyundai Motor North America (HMNA) comments on the Advanced Notice of Proposed Rulemaking (ANPRM) concerning Automated Driving System (ADS) safety.

The potential benefits of Automated Vehicles (AVs) are well known. As stated in 'Ensuring American Leadership in Automated Vehicle Technologies – Automated Vehicles 4.0' published in January of 2020: "Potential benefits to the American public could include improved safety and a reduction in roadway fatalities; improved quality of life, access, and mobility for all citizens; lower energy usage; and improved supply chain management."

On the other hand, AVs pose significant safety, regulatory, security and privacy challenges that must be addressed in order for the technology to succeed and yield its potential benefits. The shared objective for government and industry is to accelerate the deployment of AV technology in order to maximize its safety benefits while simultaneously addressing the imperative to minimize or eliminate any adverse consequences associated with the technology. HMNA is fully committed to these dual objectives, and we are pleased to offer the following comments in response to the ANPRM.

Existing regulatory requirements, including the FMVSS, allow for the deployment of AVs. There has been much attention focused on the need to resolve existing FMVSS requirements that are not necessary or appropriate for AVs, and this emphasis is justified. It is important to note, however, that existing FMVSS do not prevent the deployment of FMVSS-certified AVs. Indeed, FMVSS certified AVs with traditional vehicle controls have been deployed by various manufacturers. These involve fully compliant motor vehicles that are upfitted with ADS technology in a manner that allows for both human and automated control of the vehicle. This is not unique to AVs; there are other examples where a particular vehicle operating condition does not allow compliance to an FMVSS requirement to be demonstrated. For example, compliance to FMVSS 126 and 135 cannot be demonstrated while cruise

control is engaged; compliance to FMVSS 111 cannot be demonstrated while a full-display mirror video function is enabled; compliance to FMVSS 108 vision requirements often cannot be demonstrated when the tailgate of a pickup truck is deployed. These conditions are acceptable so long as the operating condition can revert to a state where FMVSS compliance can be demonstrated and the vehicle is certified. Certainly, once a vehicle achieves a high level of automated driving capability, many design features of traditional vehicles (manual controls, rearview mirrors, traditional seating configurations, etc.) may become superfluous or suboptimal. Once this occurs, some existing FMVSS requirements become unnecessary and/or inappropriate, and this situation needs to be addressed. Nevertheless, it is important to recognize that existing FMVSS do not prevent the deployment of AVs, provided those AVs include the attributes of traditional (FMVSS certified) vehicles.

HMNA recommends that NHTSA adopt a performance-based assessment of the capability of AVs. The ANPRM discusses various approaches that have been pursued by NHTSA and others to assess the performance capability of AVs, including computer simulations, exemplar road test conditions and procedures, etc. The various approaches have advantages and limitations in terms of their efficacy across the spectrum of AV designs and use cases. Despite the challenges, HMNA encourages NHTSA to adopt in the relatively near term (perhaps 2 or 3 years) a protocol to evaluate the performance of AVs in real-world driving scenarios. There is already a wealth of knowledge that could inform NHTSA's initial efforts to establish AV performance criteria. The ANPRM notes several modeling approaches, including NHTSA's 'Instantaneous Safety Metric' (ISM) and the 'Model Predictive ISM', the Rand report on 'Measuring Automated Vehicle Safety', and the NVIDIA work on 'Safety Force Field', among others. Another approach might be to investigate the test-track procedures of individual AV manufacturers, and synthesize from those a core set of procedures that could be applied across AV designs. Another excellent resource for a near-term assessment of AV safety could be the extensive work that is well underway in the WP29 Working Party on Automated/Autonomous and Connected Vehicles (GRVA) and its multiple Subgroups. NHTSA has attended at least some of these GRVA/Subgroup meetings and is likely well aware of the important work they are doing. Other research and academic organizations (such as Virginia Tech's Center for Automated Vehicle Systems) could also provide useful input for a near-term AV assessment protocol. This initial protocol need not be a refined assessment that provides a granular comparative evaluation of AVs. Rather, the intent of this near-term assessment would be to segregate credible AV designs from insufficient offerings that do not meet a minimum level of acceptable safety performance. In addition to distinguishing capable AV manufacturers from those who lack the wherewithal or commitment to provide adequate safety, this initial protocol could provide the foundation for building more discriminating performance assessments as research, AV learnings and field data mature. Given the time and rigors required for FMVSS rulemaking, this near-term assessment might initially be adopted as

an NCAP evaluation or voluntary industry agreement, perhaps as a prelude to one or more FMVSS. In any event, HMNA supports a minimum level of safety assessment of AVs in the near term to help safeguard against inadequately developed AVs.

NHTSA has demonstrated its willingness to enable non-traditional variants of AVs with FMVSS rulemaking and the Part 555 exemption process. NHTSA has published multiple AV Federal Register Notices in the past few years, including RFCs, ANPRMs, NPRMs, and most recently a Final Rule sent to the Federal Register that would amend various 200-Series standards to accommodate certain types of AVs. These rulemaking Notices have been thorough and lengthy, and they demonstrate NHTSA's commitment to paving the way for the deployment of FMVSS compliant AVs. In addition to rulemaking, the Agency has reviewed Part 555 exemption requests for AVs, including granting an exemption to Nuro, Inc. in a Federal Register Notice that was published on February 11, 2020. As mentioned above, these rulemaking and Part 555 proceedings are necessitated by non-traditional variants of vehicles wherein some existing FMVSS requirements are not necessary or appropriate to the AV design. In the case of Nuro, the exemption from aspects of FMVSS 500 was justified on the basis that the low-speed vehicle is a delivery vehicle that does not transport occupants. HMNA commends the Agency for its extensive work to enable the safe deployment of AVs that deviate from traditional (FMVSS compliant) vehicle configurations. We also agree with NHTSA's separation of rulemaking into a logical cadence; e.g., for controls and displays, for vehicles that may lack traditional controls, and for longer-term rulemaking to develop appropriate crashworthiness requirements for vehicles with non-traditional seating configurations. The Agency has recognized, however, that there are difficulties with rulemaking and Part 555 reviews to resolve existing FMVSS requirements that are not necessary or appropriate to particular AV designs. These challenges include the time and resources required to conduct these rulemakings and exemption reviews, the potential of such rulemaking to hinder innovation, the perpetual nature of this work, and the fact that the significant resources applied to 'housekeeping' rulemaking do little to advance the actual safety of AVs.

As an alternative to FMVSS rulemaking and Part 555 exemptions to reconcile unnecessary FMVSS requirements, NHTSA might consider the following approach to accomplish the same goal. HMNA offers a potential alternative to standard-by-standard rulemaking and case-by-case exemptions to resolve existing FMVSS requirements that are not necessary or appropriate for AVs. Namely, NHTSA could adopt a single FMVSS in the near term (perhaps 1 or 2 years) that would allow manufacturers discretion to identify existing FMVSS requirements that are not appropriate to their particular AV design, provide a bona fide rationale for each identified deviation from an FMVSS requirement, provide technical data demonstrating that the deviation will not degrade safety

performance, and include an ongoing reporting requirement analogous to what is specified in the Nuro exemption. This proposed FMVSS would be similar to a strengthened Part 555 exemption proceeding, with the key distinction being that NHTSA's approval would not be required to enable manufacturers to self-certify FMVSS compliance. HMNA recognizes that this alternative to standard-by-standard rulemaking and Part 555 exemptions would be a significant departure from normal regulatory practices, and that the Agency may have reservations with the provision that would allow manufacturers to self-determine needed deviations from existing FMVSS requirements. Nevertheless, we encourage NHTSA to consider this approach based on the following: (1) This alternative would free up substantial government and industry resources to work on value-added AV safety initiatives, (2) It would avoid the shortcomings of multiple protracted rulemakings that would take years to complete, impede innovation, and risk being obsolete by the time they are published, (3) Any concern with manufacturers abusing the flexibility to self-define FMVSS that are not suitable for their AV design can be addressed in the language of the proposed FMVSS. For example, the regulatory text could specify that all exceptions to existing FMVSS must have a clear and bona fide justification. A manufacturer who short-cut this requirement could be found out of compliance, and (4) This proposed FMVSS would not diminish NHTSA's authority to order the recall or suspension of AV deployments that may pose an unreasonable risk to safety. HMNA would be pleased to provide a draft outline of this proposed FMVSS and/or submit a petition for rulemaking if the Agency may be amenable to this approach.

NHTSA should require from the onset that AV deployments exhibit a level of safety at least equivalent to an otherwise comparable non-AV. HMNA recommends that NHTSA leverage the expertise of the National Center for Statistics and Analysis, manufacturers, universities, private companies and others to refine the ability to compare the actual field safety performance of AVs to otherwise comparable non-AVs. NHTSA should require that any AV deployment demonstrate field performance at least equivalent to an otherwise comparable non-AV. This threshold safety criterion can provide NHTSA confidence of the safety performance of these vehicles on public roads.

NHTSA can apply its existing administrative mechanisms to assure the safe and successful deployment of AVs. Beyond the high-level comments and recommendations outlined above, there is much work for NHTSA, manufacturers, states and other stakeholders to pave the way for the successful and widespread deployment of AVs. The Agency's existing administrative procedures are well suited to this work. This includes the normal technical reviews, research, and testing that will lead to the development of AV specific NCAPs, voluntary agreements and/or FMVSS requirements. It will also be important for the Agency to continue and expand its communications and outreach initiatives involving

manufacturers, states, first responders, consumers, international regulatory authorities, infrastructure providers and other stakeholders to facilitate the adoption of best practices and broaden consumer understanding of the technology.

HMNA looks forward to further dialogue with NHTSA regarding the exciting and world-changing prospects of automated vehicles.

Sincerely,

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