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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION
DOCKET # NHTSA-2020-0106

Advance Notice of Proposed Rulemaking:
Framework for Automated Driving System Safety

SUBMITTED BY:
American Trucking Associations
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The American Trucking Associations (ATA) submits these comments in response to the National Highway Traffic Safety Administration (NHTSA) advance notice of proposed rulemaking (ANPRM) on a *Framework for Automated Driving System Safety*.[1]

As the national representative of the trucking industry, ATA has a strong interest in matters affecting our nation's transportation system and is committed to advancing automated driving systems (ADS) or automated vehicle (AV) technology in ways that benefit the trucking industry, including improving highway safety for all road users, reducing traffic congestion and vehicle emissions, as well as increasing the efficient movement of freight. Directly and through our affiliated organizations, ATA's united federation of motor carrier and allied members, state trucking associations, and national trucking conferences and councils represent nearly 40,000 industry stakeholders in North America – encompassing every type and class of motor carrier operation. Our allied members include original equipment manufacturers, supply chain and logistics companies, technology suppliers, and service providers – all engaged in supporting the development of ADS-equipped commercial motor vehicles (CMVs).

Automated vehicle technology is the next step in the evolution of highway transportation safety and movement of people and goods. Automated vehicle technology comes in many levels that will assist the driver, and, in some cases, handle the driving task. As the U.S. Department of Transportation (DOT) develops a framework, ATA emphasizes the need to prioritize CMVs, heavy specialty vehicles, and trailer-combination vehicles in a manner equal to passenger vehicles. Approximately 37 million trucks

[1] 85 Fed. Reg. 78058. (Dec. 3, 2020).

(all commercial Classes) move nearly 12 billion tons of freight annually.[2] The trucking industry moves more than 80 percent of our Nation's domestic freight and is a critical player in the safety of our Nation's roadways. As these statistics demonstrate, trucking is the industry most responsible for moving America's economy, and has a substantial stake in the success of AV transportation.

As noted in our comments filed with NHTSA in March 2018 regarding *Removing Regulatory Barriers for Vehicles with Automated Driving Systems*, from the trucking industry perspective, the primary role of the federal government over state governments in the deployment of AV technologies is essential.[3] Our industry relies on interstate highways to facilitate the free flow of goods between states. As AV technology is commercialized, it is critical that state and local laws do not create disparities that slow the adoption of these safety and productivity-boosting technologies. An important element of this commercialization is the development of a unified national framework of laws and regulations that facilitate the safe development, testing, deployment and operation of AVs. This includes a clear process and standards-setting role – guidance/framework prior to mandates – for the federal government that precludes state efforts to regulate vehicle design. For example, focusing more efforts on truck-related safety issues and aligning with industry-recognized standards and best practices are foundational principals an ADS framework should be built on.

ATA commends NHTSA for providing first steps and an outline of methods that would objectively define, assess, and manage the safety of ADS performance while ensuring the needed flexibility to enable further innovation. This approach allows for specific feedback on key components that can meet the need for motor vehicle safety while enabling innovative designs, in a manner consistent with agency authorities. The ANPRM raises several topics and scenarios, followed by a list of more specific questions. In our comments below, ATA first provides some general comments on the broader issues, and then responds to the questions posed in Section V of the ANPRM.

I. NHTSA ANPRM GENERAL COMMENTS

ATA is optimistic about the benefits of ADS, and although industry AV developers and truck manufacturers are growing in testing and developing, the technology is still at an early stage for national scale deployment. Demonstrations have so far been limited to a few regions of the country, and, in trucking, confined to highway and open road domains. There is still a way to go, which is why ATA agrees that any proposed Federal Motor Vehicle Safety Standards (FMVSS) should follow technological maturity. Specifically, ATA agrees with the approach of an initial NHTSA safety framework that does not establish FMVSSs and instead looks beyond their application to novel vehicle designs while creating a framework specifically tailored to ADS.[4]

As stated in the notice: "*Rather than elaborating and prescribing by rule specific design characteristics or other technical requirements for ADS, NHTSA envisions that a framework approach to safety for ADS developers 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."*[5] ATA agrees. Including industry best practices and building off the three primary ADS guidance documents issued in recent years by DOT (i.e., *Automated Driving*

[2] ATA. (2020). *American Trucking Trends 2020*. Arlington, VA.
[3] Retrieved from NHTSA-2018-0009-0104, pg. 2.
[4] *Id.* at 78058.
[5] *Id.* at 78059.

Systems 2.0: A Vision for Safety, *Preparing for the Future of Transportation: Automated Vehicles 3.0*, and *Ensuring American Leadership in Automated Vehicle Technologies: Automated Vehicles 4.0*) is the appropriate role of the Agency in facilitating ADS risk management. As this framework comes into view, ATA offers two guiding principles through which we view NHTSA's role.

Technology Neutral. ATA shares NHTSA's interest in promoting a framework that is, at its core, technology neutral.[6] In ATA's view, prematurely locking in safety standards before demonstrating technological readiness risks inadvertently stifling the market for innovative safety systems. Proposed regulations and guidance should not pick winners and losers, or, by extension, create disincentives for investments in future improvements and enhancements to AV technologies. Safety standards should instead be made flexible and responsive to potential future technologies that may be safer than current regulation.

As stated in the ANPRM, "[T]*he more quickly vehicle systems can change, the greater the risk that the current regulatory requirements may unnecessarily interfere with innovation, and that the slow pace of the regulatory process to address unnecessary barriers may delay the introduction of new safety improvements.*"[7] NHTSA should work with ATA, including ATA's Technology & Maintenance Council (TMC),[8] and industry more to craft guidance on ADS-equipped CMVs to ensure that current industry best practice is adequately suited to the regulatory flexibility. Existing partnerships can help the Agency avoid the unintended consequences that may be created when, for example, a specific technology is required without a demonstrable economic or safety benefit. ATA recommends that NHTSA leverage its ongoing partnership with industry, such as ATA's partnership with the Federal Motor Carrier Safety Administration's (FMCSA) *Tech-Celerate Now* program[9] to achieve this goal.

ATA's TMC is a perfect example of motor carrier and industry collaboration. Through the development of Recommended Practices,[10] TMC supports industry activities that optimize business operations, CMV purchasing, maintainability, and technology that improves equipment longevity and transportation safety. For 65 years, TMC has supported the trucking industry through many technologies and recently initiated a study group specific to AVs and ADS technologies. ATA encourages NHTSA to work closer with TMC in developing a framework that best suits the trucking industry as well as all road users.

Performance Based. NHTSA should ensure government and industry are working together to create performance-based standards that focus on quantifiable outcomes. Requiring AVs to meet a certain level of safety, rather than use any specific technology, can focus regulations on managing risk within specific operating environments. For example, voluntary safety self-assessments (VSSAs) have been very successful in providing NHTSA more information about an AV manufacturer or ADS supplier so that government, private sectors, and the public gain a better understanding of the level of safety that is developed before deployment and added during operation. VSSAs may become a key component in

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[6] *Id.* at 78071.
[7] *Id.* at 78071.
[8] TMC is an association of motor carriers, truck OEMs, technology suppliers, and service providers that develop maintenance and engineering best practices, and provides extensive education to stakeholders on technical issues and advanced technology.
[9] FMCSA. (2019). *Tech-Celerate Now*. Retrieved from www.tech-celeratenow.org.
[10] TMC. (2020). *TMC 2020-2021 Recommended Practices Manual*. Arlington, VA. ATA.

collecting and aggregating information to base future minimum performance-based standards in setting the bar for AV companies entering the transportation market.

II. RESPONSES

A. 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? (Question 5).

ATA views the Agency assessment of ADS-equipped vehicles as in the same current manner the Agency best assesses each truck and auto manufacturer that adequately demonstrates its ability to meet each relevant FMVSS. ATA supports equal enforcement and equipment recall authority from federal government on all vehicle classes, and also state regulatory action. In addition, vehicle testing is an imperative step for AV readiness. Truck and auto manufacturers put their vehicles through strenuous testing to maximize performance based off the minimum standards set by the FMVSS. It is important for the Agency to understand the costs associated with this testing and developing a framework that is practical, consistent, and does not require additional assessment for AV components.

Furthermore, this question and *Part III. A. 2. Other Safety Functions* of this notice align in providing a response best suited for trucking. The ANPRM states, *"NHTSA requests comment on which of these aspects the Agency should prioritize as it continues the research necessary to develop a safety framework. NHTSA also seeks comment on whether it has an appropriate role to play with any or all of these elements outside of research. If so, which element(s)? For each such element, should NHTSA's role be regulatory or sub-regulatory, and in what manner?"*[11] For CMVs, the eight provided aspects account for how the vehicle operates and would react to real-world situations. ATA's comments to the August 2019 FMCSA ANPRM, *Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles*, include content relevant to this prioritization. For example, with respect to the first aspect, "*[I]dentifying reduced system performance and/or [operational design domain, ODD] in the presence of failure,"* ATA previously commented that:

> *"The developer of an ADS or the manufacturer of an ADS-equipped vehicle should be responsible for defining the ODD for their own system, as they would have the most knowledge of the capabilities and limitations of the ADS technology installed on the vehicle. In its oversight role, FMCSA should require that ADS developers and manufacturers of ADS-equipped vehicles define ODDs, recognizing that an ODD is something that may not be static for the life of an ADS, and could be altered based on software updates or other changes by the ADS developer. The FMCSA should provide clear guidance and standards for defining out of compliance conditions that determines a reportable condition and the timeline and supporting documentation required for reporting the out of compliance condition."*[12]

With respect to the fourth aspect, "[R]*ecognizing and reacting appropriately to communications from first responders, including fire, EMS, and law enforcement*," ATA agrees that:

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[11] *Id.* at 78064.

[12] Retrieved from FMCSA-2018-0037-0288, pg. 6.

- Any Federal regulation or guidance regarding interaction with emergency responders should be performance-based, allow AV developers/manufacturers the flexibility to develop design requirements, and be compatible with industry standards to facilitate such capabilities;
- AV operators should publicly share, as part of a VSSA, how their AVs respond to and interact with emergency first responders; and
- ATA supports connected vehicle-to-everything (V2X) safety communications for first responder traffic safety but does not consider V2X as a requirement or single solution for commercial AVs reacting to emergencies. Vehicle safety communications should be considered as a viable option or additional method and not a prerequisite for AVs.

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

NHTSA proposes to view ADS through a framework of sensing, planning, perception and control. While ATA agrees this classification could assist the Agency's understanding of AV system core functionalities, the Agency should also evaluate the interplay of these safety systems with each other and as a whole. ADS is more than just the siloed capabilities of four safety systems. In fact, the systems function together to respond to the external environment. Given the number of software and hardware products that may come to market in the coming decades, the Agency's evaluation of the four systems with one another and as a whole will better enable scientific study of the efficacy of ADS on safety.

NHTSA should also be prepared to adapt its understanding of these four core safety systems as products develop, and, in writing regulations, prepare for future adaptations as necessary. ATA expresses caution over whether labeling functions to ADS could limit developers' requirements or insufficiently align a vehicle manufacturer or aftermarket ADS to NHTSA's engineering measures. To that end, ATA recommends an advisory committee to support agency oversight of ADS-related aspects.[13] Such a committee should be multi-modal and have private and public interests for all road users benefiting the Agency's decisions on the areas of guidance or regulation to prioritize.

The notice mentions, "[I]*f new FMVSS were developed and adopted, they could be applied on an 'if-equipped' basis to existing traditional classes of vehicles,"* meaning an FMVSS would not require ADS in motor vehicles, but instead specify performance requirements for those vehicles equipped with ADS. ATA supports the Agency to explore FMVSS for ADS-equipped vehicles on an *if-equipped* basis that separates conventional vehicles (i.e., SAE AV L0-L2) from AVs/ADS-equipped vehicles (i.e., SAE AV L3-L5).[14] Such an FMVSS would not be applied to new vehicle classes as a whole, *i.e.*, subclasses of vehicles equipped with ADS, but a specific subset of vehicles with ADS functionalities. In addition, the administrative feasibility of creating, updating, and implementing requirements for FMVSS on an if-equipped ADS basis would provide flexibility and ease of understanding which standard is for what type of vehicle. We reiterate here that it is currently too early to develop FMVSS, as the technology is still maturing.

Finally, current regulations should conform to a NHTSA framework and unnecessary safety standards should be reconsidered. For example, (aside AVs, but relevant to the notice) *FMVSS No. 108; Lamps, reflective devices, and associated equipment* has issue with new semi-truck/tractors required to

[13] *Id.* at 78060.
[14] SAE International. (June 2018). *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles*. Retrieved from https://www.sae.org/standards/content/j3016_201806/.

be equipped with rear license plate light systems. FMCSA granted ATA's petition[15] for not requiring the lamp due to having no safety benefit and while majority of tractors are in combination, whereas, the light is not in sight. This regulation change benefits CMV inspections, however the safety standard still burdens motor carrier new vehicle in-service procedures. In addition to developing a solution to this issue, ATA supports a NHTSA framework that considers all types of vehicles and operations.

C. 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? (Question 8).

ATA suggests more collaboration with the manufacturers of ADS, CMVs, and the current and potential buyers/users of the technology to better understand which existing regulations hinder deployment and public safety. For trucking, ATA holds four national events and several webinars throughout each year where nearly all AV truck developers, technology suppliers, partnered and interested fleets meet. NHTSA should adhere to AV stakeholder issues more regarding existing regulations or on new ones to be developed.

The ANPRM also seeks similar comment on "[W]*hat next steps the Agency should take in the regulation of ADS, the timing of those steps, and whether any of the abovementioned steps are required for the development of an ADS-specific FMVSS regime that achieves appropriate standards for highway safety while preserving incentives for innovation and accommodating improvements in technology."*[16] In *Part IV. B. 5. Examples of Regulatory Approaches*, examples A, B, and C are described in providing possible regulatory approaches. Example B, "*FMVSS Requiring Vehicles to Be Programmed to Drive Defensively in a Risk-Minimizing Manner in Any Scenario Within Their ODD*" has potential, but ATA favors neither of the provided examples and suggests more study to better understand an ADS specific FMVSS regime.

As stated[17] in the notice: *"Future motor vehicle safety standards will need to be more flexible and responsive, technology-neutral, and performance-oriented to accommodate rapid technological innovation. They may incorporate simpler and more general requirements designed to validate that an ADS can safely navigate the real-world roadway environment, including unpredictable hazards, obstacles, and interactions with other vehicles and pedestrians who may not always adhere to the traffic laws or follow expected patterns of behavior. Existing standards assume that a vehicle may be driven anywhere, but future standards will need to take into account that the operational design domain (ODD) for a particular ADS within a vehicle is likely to be limited in some ways that may be unique to that system."* ATA agrees that the ODD definition and its management are important parts of any ADS safety case. Identifying these ODDs and managing them within a set operational enviornment makes it possible for AV developers to test and validate ADS using quantifiable metrics. These management components should be considered in both near- and long-term guidance.

ATA supports a framework that is technology-neutral and validated through performance-based approaches. It should arrive at that process through public engagement – formulating rules no more

[15] Docket No. FMCSA-2015-0176-0020.
[16] *Id.* at 78073.
[17] *Id.* at 78072.

elaborate than necessary to meet the needs of highway safety, while leaving ample room for innovation. In addition to the metrics proposed in the notice, NHTSA could also assess technological readiness in determining whether such regulation is needed. Safety methodologies and NHTSA readiness determinations could be based on ADS adoption rates in the relevant market segment for the technology. ATA also agrees that guidance does exist in industry-recognized standards such as ISO 26262 and 21448 along with other examples still in discussion such as UL 4600 for providing the Agency and manufacturers primary guiding principles.

D. If NHTSA were to develop standards before an ADS-equipped vehicle or an ADS that the Agency could test is widely available, how could NHTSA validate the appropriateness of its standards? How would such a standard impact future ADS development and design? How would such standards be consistent with NHTSA's legal obligations? (Question 9)

ATA does not support developing FMVSSs before ADS-equipped CMVs are more widely deployed in the U.S. NHTSA should focus on industry-recognized best practices, consensus-based industry standards, demonstrations and then flexible, performance-based FMVSSs after technology maturity. Examples to include in federal guidance or best practices may be: vehicle design, ADS development, ODD testing and deployment, terms-of-service, real-world modifications, self-certifying, and industry-based research and standards. ATA agrees with this statement in the notice:

> *"Establishing FMVSS prior to technology readiness hampers safety-improving innovation by diverting developmental resources toward meeting a specific standard. Such a regulatory approach could unnecessarily result in the Agency establishing metrics and standards without a complete understanding of the technology or safety implications and result in unintended consequences, including loss of potential benefits that could have been attained absent government intervention, a false sense of security, or even inadvertently creating additional risk by mandating an approach whose effects had not been known because regulation halted the technology at too early a stage in its development."*[18]

However, if NHTSA were to develop standards before an ADS-equipped CMV is widely available, NHTSA could validate the appropriateness through a combination of guidance (i.e., aforementioned examples), the ANPRM's eight listed *Critical Factors,*[19] existing standards (such as those listed in DOT's *AV Comprehensive Plan*[20]), and matured VSSAs – proving market growth, AV performance improvement, and ability to self-certify. The Agency should prioritize manufacturer and AV developers' process to self-certification. As VSSAs are maturing and NHTSA's *AV Test Initiative* grows, including such a process in the framework would permit NHTSA to set standards while reducing the administrative burden of adding compliance to a range of ADS technologies and AVs. Although ATA does not support requiring disclosure or approval regarding regulatory reporting mechanisms, exploring enhancements to traditional manufacturer requirements for NHTSA's management is justified. For example, the World Manufacturing Identifier, vehicle identification number, or NHTSA registration (i.e., § 565.15) could provide a level of assurance for ADS-equipped vehicles meeting FMVSS.

E. Of the administrative mechanisms described in this document, which single mechanism or combination of mechanisms would best enable the Agency to carry out its safety mission, and

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[18] *Id.* at 78070.
[19] *Id.* at 78073.
[20] USDOT. (Jan. 11, 2021). *Automated Vehicles Comprehensive Plan*. Washington, DC. Pg. 13.

why? If you believe that any of the mechanisms described in this document should not be considered, please explain why. (Question 16).

This question and *Part IV. A. 3. Operational Guidance* of this notice align in providing a response best suited for trucking. The ANPRM states, *"The Department has therefore sought to enhance safety through voluntary guidance, instead of mandatory requirements. The Agency is requesting comment on whether developing further guidance on engineering and process measures remains the most appropriate approach."*[21] ATA would support NHTSA to continue developing guidance on engineering and process measures for the most appropriate approach for voluntary mechanisms. The trucking industry favors adopting new technology voluntarily and have regulations follow from those stakeholder partnerships.

F. Discuss how each element of the framework would interact with NHTSA's rulemaking, enforcement, and other authority under the Vehicle Safety Act. (Question 22).

This question and *Part III. B. 3. UL 4600* of this notice align in providing a response best suited for trucking. The ANPRM states, *"NHTSA requests comment on the specific ways in which Functional Safety, SOTIF, and/or UL 4600 could be adopted, either modified or as-is, into a mechanism that NHTSA could use to consider the minimum performance of an ADS or a minimum risk threshold an ADS must meet within the context of Vehicle Safety Act requirements."*[22] The standards and core elements suggested in the notice provide a good starting point in developing a NHTSA framework that supports rulemaking, enforcement, and Agency authority. Standards and industry-recognized best practices, such as SAE, ISO, and TMC are currently improving trucking industry equipment and operations and will into the future however ADS is applied. Specifically, ATA suggests a greater emphasis on NHTSA's involvement in standards and best practice setting bodies, such as SAE's On-road Automated Driving Committee, Automated Safety Committee, and TMC's Automated & Electric Truck Study Group. Collectively, these groups of transportation stakeholders provide the majority of market available manufacturers and suppliers of ADS through quality processes. Although the UL 4600 guidance incorporates a more complete view of the ADS safety development process, more stakeholder collaboration must be considered when developing new standards.

G. Discuss how each element of the framework would interact with Department of Transportation Rules concerning rulemaking, enforcement, and guidance. (Question 23).

This question and *Part IV. B. 2. NHTSA's FMVSS Setting Authority* of this notice align in providing a response best suited for trucking. The ANPRM states:

> *"Furthermore, there are notable instances in which NHTSA has regulated voluntarily installed technologies by simply establishing minimum safety performance requirements, as opposed to mandating the installation of a technology, include when the Agency anticipated the introduction of electric and compressed natural gas vehicles and fuel systems, and issued standards to guard against risks of electric shock and explosion."*[23]

ATA would caution the Agency in considering vehicles over 10,000 lbs. when setting regulations intended only for vehicles 10,000 lbs. or less. In previous years, to provide certainty and consistency in

[21] *Id.* at 78068.
[22] *Id.* at 78066.
[23] *Id.* at 78070.

the Federal role, unified guidance for all AVs was needed. Now that the foundation has been set, NHTSA should ensure all use cases are not treated identically. DOT's recent *Automated Vehicles Comprehensive Plan* emphasized the relevant research, voluntary information-sharing, stakeholder engagements, guidance documents and regulations the Department is developing for different use cases. ATA submitted comments[24] supporting how the Department constructively outlines the differences between ADS use cases. Similarly, individually owned vehicles that can switch between driverless and driver-assist modes should be treated differently from autonomous trucking systems that will be deployed and maintained as a fleet.

For over five years, ATA has been expecting *FMVSS No. 304; Compressed natural gas [CNG] fuel container integrity* to be amended to change the inspection criteria listed on the label of CNG tanks to state that CNG fuel containers used on heavy vehicles should be inspected at least once every 12 months.[25] This issue arises from the Agency not being careful about the different considerations that apply to different vehicle classes and designed operations. The trucking industry continues to be financially burdened by this FMVSS, requiring fleets to stop operations and inspect tanks and CNG vehicle systems more often than needed. The NHTSA framework as outlined in this notice must consider all types of vehicles and and use cases in order to avoid unintended consequences that cannot be remedied quickly.

III. CONCLUSION

ATA believes that the deployment of AV technology for all vehicle types has the potential to improve safety, congestion, and our Nation's freight movement environment. Automated vehicle technology is the next step in the evolution of safety technologies currently available and will help to further improve the safety of the trucking industry and all road users for transportation. Thank you for consideration of our comments. If you have any questions, please contact Ross Froat at (703) 838-7980 or rfroat@trucking.org.

Sincerely,

Ross Froat
Director of Technology & Engineering Policy
American Trucking Associations

[24] ATA. (March 22, 2021). Doc. No. DOT-OST-2021-0005-0015.
[25] Docket No. NHTSA-2019-0055.