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FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION
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Comments to Advance Notice of Proposed Rulemaking: Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles

SUBMITTED BY:
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The American Trucking Associations, Inc. (ATA)[1] provides these comments in response to the Federal Motor Carrier Safety Administration's (FMCSA) advance notice of proposed rulemaking (ANPRM) on *Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles* (ADS-equipped CMVs).[2]

As the national representative of the trucking industry, ATA has a strong interest in highway safety for all motorists and vulnerable road users. Highways are the motor carriers' and drivers' workplace. Employing more than 7.8 million people and moving 10.8 billion tons of freight annually,[3] trucking is the industry most responsible for moving America's economy. 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 – spending approximately $10 billion per year on safety training, technology, equipment, and management.

[1] ATA is a united federation of motor carrier and allied members, state trucking associations, and national trucking conferences and councils created to promote and protect the interests of the trucking industry. Directly and through its affiliated organizations, ATA represents more than 40,000 industry stakeholders in the United States encompassing every type and class of motor carrier operation.
[2] 84 Fed. Reg. 24449
[3] ATA, (2019). *ATA American Trucking Trends 2019*. Arlington, VA. American Trucking Associations.

Automated and connected vehicle technologies have the potential to dramatically impact nearly every segment of the trucking industry. These technologies can bring benefits in the areas of safety, environment, productivity, efficiency, and driver health and wellness. ATA commends FMCSA for its forward-looking approach to creating a regulatory framework to support the safe integration of ADS-equipped CMVs into the U.S. transportation system, seeking input from stakeholders through actions such as this ANPRM as well as the agency's March 2018 Request for Comment concerning potential regulatory barriers to safe testing and deployment of ADS-equipped CMVs[4], and public listening sessions, complemented by the Department of Transportation's (DOT) guidance presented in Preparing for the Future of Transportation: Automated Vehicles 3.0 (AV 3.0) and regulatory initiatives by the Office of the Secretary (OST), National Highway Traffic Safety Administration (NHTSA), Federal Highway Administration (FHWA), and the Pipeline and Hazardous Materials Safety Administration (PHMSA).

The ANPRM raises a broad set of issues, followed by a list of more specific questions. In our comments below, ATA first provides some general comments on the broader issues, and then presents our responses to the questions posed in Section XI of the ANPRM.

SCOPE OF ANPRM

ATA agrees with FMCSA's approach in this ANPRM to primarily focus on SAE Levels 4-5 automation because it is only at those levels where the ADS can control all aspects of the driving task, without any intervention from a human driver.[5] Importantly, these are also the only levels where a vehicle could be operated without the physical presence of a human on board. ATA also agrees with FMCSA's approach to avoid development of an entirely separate set of rules for ADS-equipped CMVs and their operation and with the roles described for FMCSA and NHTSA in the regulation of AVs as presented in Section V of the ANPRM:

> *In approaching the task of adapting its regulations to accommodate automated vehicle technologies, FMCSA is considering amendments to its rules to account for significant differences between human operators and ADS. The Agency's preliminary approach is to avoid development of an entirely separate set of rules for ADS-equipped CMVs and their operation. The Agency would rely on NHTSA to establish Federal standards, if necessary, applicable to ADS equipment manufacturers (whether of original or aftermarket equipment), while FMCSA would focus on those rules necessary to ensure that motor*

[4] 83 Fed. Reg. 12933
[5] 84 Fed. Reg. 24450

> *carriers operating ADS-equipped CMVs have a uniform regulatory framework within which to operate in interstate commerce.*[6]

With regard to lower levels of automation, ATA also agrees with the approach FMCSA presents in Section VII of the ANPRM:

> *Generally, FMCSA does not believe there is a need to revise the FMCSRs to accommodate the integration of Levels 1-3 equipment because a licensed CMV operator must be present at the controls of the vehicle at all times. FMCSA's driver-related rules would thus apply. The Agency reminds interstate motor carriers of their responsibility for having safety management controls in place to ensure the safe operation of such ADS-equipped CMVs, in full compliance with the applicable safety requirements. For example, for drivers of CMVs at Levels 1-3 (and obviously at Level 0) the Agency's CDL, controlled substances and alcohol testing, physical qualifications, driver distraction, and HOS rules would be applicable. The Agency, though, may consider guidance and other assistance that could identify best practices for safely operating vehicles with these lower-level systems, as they may present issues not present in more traditional vehicles.*[7]

ATA notes that in several places throughout the ANPRM, responsibilities are placed on the motor carrier such as to ensure the vehicle has appropriate dashboard notification lights and signals for law enforcement to understand the functionality of the AV system. In addition, the document suggests that motor carriers ensure the system responds appropriately to emergency vehicles and law enforcement. Because most of the ADS technology will be proprietary, carriers cannot and should not take responsibility for the basic systems of an ADS-equipped CMV, which more appropriately belong to the manufacturer.

Industry also has a role in facilitating ADS development and deployment. For example, ATA's Technology & Maintenance Council (TMC) has as its core function the development of industry-recognized recommended practices that are used by fleet managers to efficiently specify and maintain vehicles. TMC's industry best practices also provide guidance to manufacturers in the design of their equipment. These practices provide a vital technical basis to assist government agencies in evolution of the regulatory framework. ATA encourages DOT's involvement in TMC and believes through this collaboration that government and industry can and will provide a positive CMV ADS transportation environment.

OPERATIONAL DESIGN DOMAIN (ODD)

[6] 84 Fed. Reg. 24451
[7] 84 Fed. Reg. 24451

ATA agrees with FMCSA that the ODD should include information regarding roadway types, geographic area, speed range, and environmental conditions in which the ADS is designed to operate safely and that ADS-equipped vehicles should be operated in L4 or L5 modes only within their ODDs.[8] This will be accomplished through a combination of operating policies of the motor carrier (based on information about the ODD from the ADS-developer) and system design features that will limit the operation of an ADS-equipped CMV in L4/L5 to the appropriate ODD conditions.

In the ANPRM, FMCSA's requests comment on potential restrictions or prohibitions regarding the transport of hazardous materials. Given the duties and responsibilities beyond the driving task that are required of drivers transporting hazardous materials, it is anticipated that in the near-term there will continue to be a fully qualified driver/operator (i.e., meeting the requirements of 49 CFR §177.816) present during the transport of hazardous material. Some foundational ADS technologies – such as automatic emergency braking systems, lane keeping assistance, and roll stability control – are currently in service on CMVs operating on roads today. We anticipate that carriers will deploy these features in CMVs transporting non-hazardous materials before they would be applied to the transport of hazardous materials.

VOLUNTARY CONSENSUS STANDARDS

The role of industry in facilitating the development and deployment of ADS should also be recognized. For example, ATA's Technology & Maintenance Council (TMC) has as its core function the development of industry-recognized recommended practices that are used by fleet managers to efficiently specify and maintain vehicles. TMC's industry best practices also provide guidance to manufacturers in the design of their equipment. It is vital that industry standards developers, which includes organizations such as TMC and SAE International, and others, address the challenges in understanding and communicating the specification and maintenance issues surrounding the rapidly evolving technologies involved in ADS, updating existing practices and developing new consensus driven practices. These practices provide a vital technical basis to assist government agencies in evolution of the regulatory framework. Additionally, technology developers and producers have an important role to play in sharing information, without compromising proprietary intellectual property, to both government and industry regarding safety, operational performance and maintenance requirements for ADSs. To this end, TMC's Automated and Electric Vehicles Study Group (S.18) is directed to develop maintenance and engineering best practices for Levels 3, 4 and 5 of ADS-equipped CMVs, connected vehicle systems (such as platooning), and commercial vehicle electric powered systems. TMC's S.18 scope includes the study of malfunctions, deficiencies, and failures of such

[8] 84 Fed. Reg. 24452

systems and investigate future developments in system componentry and accessories. The Study Group has completed its Task Force development survey and shall conduct additional surveys, collect data, and monitor testing programs and research of affiliated industry groups in order to develop suitable best practices that motor carriers and manufacturers can follow.

In AV 3.0, DOT expresses its support for "...the development of voluntary technical standards and approaches as an effective non-regulatory means to advance the integration of automation technologies into the transportation system." ATA agrees that voluntary technical standards have an important role to play in the development, testing, and deployment of ADS. Industry is developing many different types of technologies and communications pathways (cameras, LiDAR, radar, DSRC, etc.) that are better enabling ADS. These technologies will continue to evolve and may be joined in combination with newer technologies to execute ADS design concepts. For example, some technologies currently in the market include rapid heated washer fluid spray for extreme cleaning of the windshield – valuable for optimal ADAS performance in poor working conditions; camera monitoring systems that can replace CMV side rearview mirrors for improved viewing capabilities and fuel efficiency; and driver assistive truck platooning for improving fuel and transportation efficiencies.

The technical experts developing the systems and the end-users of these systems are in the best position to identify areas where standardization would be of benefit. Working through standards development organizations, they can quickly work to modify existing standards or create new ones where necessary. ATA is pleased that DOT recognized in AV 3.0 the work of ATA's Technology & Maintenance Council in the areas of functional/performance and cybersecurity, and we note that the TMC is also engaged in the development of maintenance and engineering best practices in support of fleet requirements to help the transportation industry ensure the maintainability, reliability, durability and security of the onboard electronics and information stored on and used by automated commercial vehicles.

MOTOR CARRIER SAFETY ASSISTANCE PROGRAMS

ATA agrees with FMCSA that through this rulemaking, FMCSA should discourage States from adopting more stringent rules concerning ADS, which could interfere with interstate commerce. The primary role of the federal government relative to state and local governments in the deployment of autonomous technologies is essential. Our industry relies on an interstate highway system that facilitates the free flow of goods between the states. As automated truck technology is commercialized, it is critical that state and local laws do not create disparities that limit commerce and obstruct the successful adoption of these potentially safety- and productivity-boosting technologies.

CONCLUSION

ATA believes that the deployment of automated vehicle technology for all vehicle types has the potential to improve safety and the environment, reduce congestion, and save fuel. Automated and connected vehicle technology is the next step in the evolution of safety technologies currently available, and will help to further improve driver safety and productivity, as well as the safety of other motorists and road users.

The following are responses to questions raised in Section XI of the ANPRM. Thank you for consideration of our comments. If you have any questions, please contact Ross Froat at (703) 838-7980 or rfroat@trucking.org.

ATA RESPONSES TO QUESTIONS IN FMCSA ADS ANPRM, SECTION XI

Issue 1: Do the FMCSRs Require a Human Driver?

ATA agrees with FMCSA's position[9], consistent with AV 3.0, that the regulations do not require the presence of a human driver or operator. It is therefore appropriate for FMCSA to interpret its regulations to no longer assume that the CMV driver is always a human (i.e., the driver could be an automated system) or that a human is present onboard a commercial vehicle during its operation, provided that the vehicle is equipped with a Level 4 or Level 5 ADS and is operating within its ODD (in the case of Level 4). In addition, we request that FMCSA codify this conclusion by including it in the upcoming proposed rule.

Q1.1 How should FMCSA ensure that an ADS-equipped CMV only operates consistent with the ODD for the ADS equipped on the vehicle?

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.

[9] 84 Fed. Reg. 24453

Q1.2. What are manufacturers' and motor carriers' plans for when and how Levels 4 and 5 ADS-equipped CMVs will become commercially available?

Several CMV OEMs and technology companies have conducted public demonstrations of CMVs with varying levels of automation and connectivity. Because future plans for production and deployment of ADS-equipped CMVs involves business-sensitive information, ATA defers to individual companies to provide FMCSA with the appropriate information.

Q1.3 Should FMCSA consider amending or augmenting the definition of "driver" and/or "operator" in 49 C.F.R. § 390.5 or define a term such as "ADS driver" to reduce the potential for misinterpretation of the requirements?

ATA believes that FMCSA should explore amending or augmenting the definitions of "driver" and/or "operator" to the extent doing so would clarify the applicability of certain regulations as stated in FMCSA's *AV 3.0*[10], "[] in the case of vehicles that do not require a human operator, none of the human-specific FMCSRs (i.e., drug testing, hours-of-service, commercial driver's licenses (CDLs), and physical qualification requirements) apply." Furthermore, such amendments could clarify that human-specific FMCSRs would continue to apply to human individuals responsible for completing any parts of the dynamic driving task (DDT) during CMV operation, as defined in SAE J3016[11], whether from onboard the vehicle or from a remote location, as well as human individuals responsible for compliance with safe operation and reporting FMCSRs, such as pre-trip inspections. As the technologies and operational models develop, ATA looks forward to working with FMCSA to identify areas within the FMCSRs that could be clarified through interpretation or that require amendment.

Issue 2: Commercial Driver's License (CDL) Endorsements

Q2.1. Should a CDL endorsement be required of individuals operating an ADS-equipped CMV?

ATA believes that any human responsible for the DDT, either in the cab of the CMV or remotely, should be required to hold a CDL. However, ATA does not see a need for a CDL endorsement for individuals operating an ADS-equipped CMV, especially at Level 4 or 5 automation where the system is able to safely operate, and reach a minimal risk condition if needed, without any human input. Given the wide range of technologies and approaches used to develop ADSs, it would be difficult to create a uniform, generic test for an "ADS" endorsement. The responsibility for ensuring that a person operating an ADS-equipped CMV is informed of the operational capabilities and limitations of the system properly belongs to the

[10] USDOT. (October 2018). *Preparing for the Future of Transportation: Automated Vehicles 3.0.* https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf.

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

motor carrier working in coordination with the ADS-supplier (i.e., the ADS developer or the OEM providing the ADS-equipped CMV).

Q2.2. If so, what should be covered in the knowledge and/or skills test associated with an ADS endorsement?

ATA does not believe a CDL endorsement for individuals operating an ADS-equipped CMV is necessary.

Q2.3. What would be the impacts on SDLAs?

Creating an ADS endorsement would be extremely burdensome for states. It would require that they acquire technical expertise either through additional training of existing staff or the addition of new staff with relevant experience to create and administer curricula and exams. The curricula and exams would also need constant updating as new ADS technologies are developed.

Q2.4. Should a driver be required to have specialized training for ADS-equipped CMVs?

When operating within their ODD, Level 4 and 5 ADS-equipped vehicles are designed to accomplish all aspects of the driving task and to enter a minimal risk condition (e.g. move onto the shoulder of the road and stop) in cases defined by the manufacturer, such as when the CMV exits its ODD or encounters a performance-relevant system malfunction. Individuals responsible for driving an ADS-equipped vehicle when outside the vehicle's ODD or in the case of a performance-relevant ADS malfunction should be trained to understand the ODD and operating characteristics of the specific ADS-equipped vehicle that they will be driving. This training can be best administered by ADS developers and their motor carrier partners, who are using the ADS-equipped CMVs on a daily basis and understand its capabilities and limitations.

Q2.5. In an operational model that has an individual remotely monitoring multiple CMVs, should the Agency impose limitations on the number of vehicles a remote driver monitors?

There may be several variations within the operational model described in this question in terms of the capabilities of the ADS technology on the truck, the ODD, and responsibilities of the individual remotely monitoring the CMV. For example, one operational model may utilize a remote operator with responsibility for manually performing the DDT under certain conditions, while in another operational model there may be a remote monitor who does not perform the DDT but is responsible for engaging when the ADS enters a minimal risk condition by sending instructions to the ADS, which would then execute the instructions using the technology on the vehicle. Notably, the SAE J3016 standard[12] states, "At higher levels of *driving automation* (levels 3-5), the *ADS monitors* its own performance of the complete *DDT*," and notes that Level 4

[12] *Id.*

automation is capable of completing the entire DDT and DDT fallback on a sustained basis "without any expectation that a user will respond to a request to intervene." Therefore, any Level 4 or 5 system should be capable of safely operating without the immediate intervention of a remote driver. Because of the many possible ADS configurations and monitoring options, it is premature to set limitations on the number of vehicles an individual can monitor. Given these variations, it is important that there is a common understanding and nomenclature (based on SAE J3016 where appropriate) such as "remote driver" and "remote monitor" with respect to their responsibilities, particularly whether they are ever expected to engage in the DDT. As developers gain experience with their systems and understand the frequency and nature of interventions by remote monitors or operators, there may be sufficient data to identify an appropriate number of vehicles that should be under supervision by a remote monitor or operator, but this will likely be specific to a particular ADS operational model.

Q2.6. Is there any reason why a dedicated or stand-by remote operator should not be subject to existing driver qualifications?

ATA believes that any person responsible for performing the dynamic driving task of a CMV, whether physically in the vehicle or from a remote location, should be required to have a CDL and subject to existing driver qualifications. ATA recognizes that the working environment for a remote operator will be different from that of a driver inside the vehicle, so there may be an opportunity in the future to modify driver qualifications for remote operators once there is sufficient data to justify any potential changes.

Issue 3: Drivers' Hours of Service (HOS) Rules

At this time when the technology and operational models for ADS-equipped CMVs are still developing, it would be premature to change HOS rules. In general, ATA believes that any person responsible for part or all of the DDT (as defined in SAE J3016) of a CMV should be subject to HOS or related fatigue management rules. FMCSA should look first to interpretations of HOS to address new roles as they emerge, such as remote drivers or drivers riding in an L4 truck with no responsibility for driving tasks or monitoring of the ADS until the truck reaches a pre-determined geographic location (such as a depot or transfer station), at which point the driver takes over manual control of the truck. As the new roles become more well-defined and experience is gained in new operational models, such as in cases where the driver could safely go off-duty while the vehicle is in motion, data should become available that would determine if there were a need for a new approach to HOS for these roles. In any event, proper fatigue management systems to ensure that CMV operators can perform their functions safely must be assured.

Q3.1. Should HOS rule changes be considered if ADS technology performs all the driving tasks while a human is on-duty, not driving; off-duty or in the sleeper berth; or physically remote from the CMV?

ATA believes that any person responsible for any part of the DDT (as defined in SAE J3016) on a CMV should be subject to HOS rules and considered to be on-duty, driving during that time, whether they are actively controlling the vehicle or, in a Level 3 system, merely in a position where they might be called upon to take control. This includes individuals physically present in the CMV as well as remote drivers located in a remote location. It should be noted that Level 4-5 systems, by definition, do not require a human to respond to a request to intervene in order to safely operate. As experience is gained with ADS-equipped CMVs, opportunities for modifying HOS rules to account for Level 4-5 systems may be identified with supporting data. Until that time, we agree with the initial approach to HOS for ADS-equipped vehicles described by FMCSA in the ANPRM:

> "The Agency believes, preliminarily, that the basic approach for applying the HOS rules should continue to be used; that is, any time a human is at the controls of an ADS-equipped CMV, either in the driver's seat or operating it remotely, the time should be recorded as on-duty, driving. Any time the human is working without having the responsibility for taking control of the ADS-equipped vehicle (because it is operating in a fully autonomous mode within its intended ODD) should be considered on-duty, not driving. For scenarios in which the human is in a sleeper-berth on a vehicle controlled by ADS technology, the human may record his/her duty status in the same manner as a team driver with hours off-duty in the passenger seat or sleeper-berth time."[13]

Q3.2. Should the HOS requirements apply to both onboard and remote operators?

Yes. See response to Q3.1.

Q3.3. If so, how should HOS be recorded when an individual is not physically in control of the vehicle?

Any person responsible for performing part or all of the DDT (as defined in SAE J3016) during the operation of a CMV should be subject to HOS rules and considered to be on-duty, driving during that time, whether they are actively controlling the vehicle or merely in a position where they might be called upon to take control. See response to Q3.1.

Issue 4: Medical Qualifications for Human Operators

Q4.1. Should some of the physical qualification rules be eliminated or made less stringent for humans remotely monitoring or potentially controlling ADS-equipped CMVs?

[13] 84 Fed. Reg. 24454

ATA believes that, as an initial approach, FMCSA should maintain current physical/medical qualification rules for individuals responsible for performing part or all of the DDT (as defined in SAE J3016) of an ADS-equipped CMV, whether they are physically present in the vehicle or in an off-vehicle location. ATA recognizes that the working environment for a remote driver will be different from that of a driver inside the vehicle, so there may be an opportunity in the future to modify physical/medical qualifications for remote drivers once there is sufficient data to justify any potential changes.

ATA also notes that the role and duties of a driver/operator of an ADS-equipped CMV will differ based on system design and capabilities, as well as operational procedures determined by the carrier – for example, some non-driving duties that have typically been performed by drivers may be performed by personnel not on-board the vehicle or not responsible for executing driving tasks. For these non-driving tasks, further study is needed before considering what physical/medical requirements should apply, if any.

Q4.2. If so, which of the requirements should be less restrictive for human operators who would take control of an ADS-equipped CMV remotely?

See response to Q4.1.

Q4.3. Should the Agency consider less restrictive rules for humans who have the benefit of ADS technology to assist them in controlling the vehicle (e.g., technologies that would enable individuals with limb impairments to operate at a level comparable to individuals without such impairments)?

ATA agrees with FMCSA's assessment presented in the ANPRM:

> "Based on FMCSA's preliminary assessment of its safety requirements and the potential of ADS-equipped vehicles, the Agency presently believes individuals responsible for taking control of an ADS-equipped vehicle on a public road should be subject to the current physical qualification standards."[14]

At Level 3 and below, ADS (Level 3) and driver assistance technology (Level 1-2) in CMVs will primarily assist the driver and in some cases handle the driving task under certain conditions within specific ODDs, with the driver/operator available to handle the dynamic driving task and other tasks, such as pre-trip inspections and interfacing with shippers and receivers. The role of the driver/operator will therefore remain a physically demanding job requiring a certain level of fitness, and all current medical requirements for drivers/operators of CMVs should be maintained.

[14] 84 Fed. Reg. 24454

At L4 and L5, where the ADS is capable of performing the driving task without intervention or reliance on a human fallback within the specified ODD, the role and duties of a driver/operator will differ based on system design and capabilities, as well as operational procedures determined by the carrier – for example, some non-driving duties may be performed by personnel not on-board the vehicle or not responsible for executing driving tasks. When discharging the responsibilities of a driver, all current medical requirements for drivers/operators of CMVs should be maintained. For the non-driving tasks, further study is needed before considering potential changes to the associated medical requirements.

Issue 5: Distracted Driving and Monitoring

Q5.1. How should the prohibition against distracted driving (i.e., texting, hand-held cell phone) apply to onboard operators responsible for taking control of the CMV under certain situations, and to remote operators with similar responsibilities?

As an initial step, ATA believes that any person responsible for performing part or all of the DDT (as defined in SAE J3016) during the operation of a CMV should be subject to all existing distracted driving regulations for CMV drivers. This requirement should apply to any driver in the driver's seat of a vehicle, as well as to remote drivers, but should not apply to on-duty drivers that are not behind the wheel of an ADS-equipped CMV. With the introduction of Level 4-5 ADS-equipped CMVs, there may be productive in-cab duties related to the delivery that could be performed by the driver while on-duty not driving. These may vary from bill of lading and delivery documents verification/preparation, planning access and egress at next delivery site, work/journey planning, re-fueling, border crossing, etc. Future studies will likely provide a better understanding of the requirements of the driver/operator in real-world driving conditions for operating the vehicle with the ADS active, which could then inform appropriate changes to distracted driving laws. The requirements may differ based on ADS design, level of automation, and the presence or absence of a driver-state monitoring system. Any decision to change these laws should be based on data demonstrating positive or non-negative consequences.

In addition, it should be noted that some ADS suppliers may design ADS-equipped CMVs with screens (i.e. display monitors) that are necessary to operate the ADS. FMCSA should consider rules or interpretations that allow drivers to consult with these screens during operation without violating §393.88, *Television receivers*, as well as rules to prevent these screens from serving as a distraction. For example, these screens should not be able to function as entertainment devices, or present information not directly related to the operation of the ADS, or impede the driver's field of view in manual operating situations.

Issue 6: Safe Driving and Drug and Alcohol Testing

Q6.1. Should FMCSA consider revising its rules to ensure that (1) any human exercising control of an ADS-equipped vehicle must continue to comply with all the rules under Part 392, and (2) a CMV under the control of a Level 4 or Level 5 ADS must satisfy the operational rules?

ATA believes that FMCSA should generally require compliance with Part 392 for any human who may be able to exercise control over a CMV. There may be certain provisions in 392 that do not make sense to apply to individuals who may be able to exercise control over a CMV from a remote location. For example, §392.16*, Use of seat belts*, could be amended so as not to apply to remote drivers. Similarly, an ADS-equipped CMV under the control of a Level 4 or Level 5 ADS must be able to satisfy all operational rules that would apply to its ODD. However, FMCSA may need to consider, either through revision or interpretation, that some of the non-driving tasks in Part 392 such as Part 392.7, *Equipment, inspection and use*, and 392.9, *Inspection of cargo, cargo securement devices and systems*, may be accomplished by personnel not on-board the vehicle or not responsible for executing driving tasks or by automated mechanisms.

Q6.2. For example, should FMCSA require that the ADS be capable of identifying highway-rail grade crossings and stopping the CMV prior to crossing railroad tracks to avoid collisions with trains, or going onto a highway-rail grade crossing without having sufficient space to travel completely through the crossing without stopping?

As stated in our response to Q6.1, as a general matter, an ADS-equipped CMV under the control of a Level 4 or Level 5 ADS must be able to satisfy all operational rules that would apply to its ODD. In the example presented in Question 6.2, an ADS-equipped CMV could have an ODD that is geographically constrained to operate in an automated mode only on roads without highway-rail grade crossings and therefore the highway-rail grade crossing requirements in Part 392 would not be relevant. However, an ADS-equipped CMV that is not constrained by its ODD to operate on roads without highway-rail grade crossings would be expected to conform to the applicable sections in Part 392.

Q6.3. For scenarios in which the control of the ADS-equipped CMV alternates, or may alternate, between a human and the technology, should FMCSA require that both the human operator and ADS comply with the applicable operational rules?

Yes, depending on its ODD, an ADS-equipped vehicle should be capable of complying with the applicable operational rules in Part 392 through some combination of the ADS and individuals present in the truck or in another location. In addition, the requirements should be focused on the operation of the vehicle, not the capability. As noted in our response to Question 6.1, FMCSA should consider that some of the non-driving tasks in Part 392 may be accomplished by personnel not on-board the vehicle or not responsible for executing driving tasks or by automated mechanisms.

Issue 7: Inspection, Repair, and Maintenance

ATA agrees that motor carriers must have appropriate inspection, repair and maintenance programs to ensure that any L4/L5 ADS-equipped CMVs they dispatch are capable of operating safely. Maintenance is already a critical area for driver and technician to perform quality pre-trips, preventive maintenance inspections or PMIs, and proficient PMI follow up repairs in preventing later drive-through shop repairs, road-call repairs, and potential equipment tows. ATA recognizes CMV maintenance advancing through ADS Levels 1, 2, 3, and views higher levels of ADS to involve more condition-based maintenance, predictive analytics (virtual technicians) and the growing use of over-the-air updates. Currently at the time of PMIs, which are frequent through a CMV's annual operation (depending on duty-cycle) and in most cases exceed the FMCSA annual inspection requirement, motor carriers also do a campaign check (component program online resource) for each electronic control unit, or ECU, that's onboard the many different types of CMVs in operation which determines if a newer software version is available. This becomes a PMI follow up repair with record of all onboard ECU statuses and ensures the most up-to-date version of safety-critical software is applied. This process, capable of being streamlined, would reflect the minimum considerations that FMCSA suggests in this issue. For example:

- At Level 4 and 5 ADS, pre-trips may become more efficient with system checks rather driver interaction with the CMV. Sensors checking themselves and even tire tread and brake wear providing a system check are feasible. The performance of a pre-trip inspection is considered most valuable.
- ATA agrees that for cargo securement, improved technology will assist in en route ADS Level 4 and 5 operations and considers the amount of technology onboard may depend on the type of motor carrier operation.
- In contemplating advanced pre-trips for Level 4 and 5, post-trip inspections may not be required with ADS system checks continuously scanning up to the time of equipment shut-off. Even structural and conspicuity checks may be provided by camera, or at least minimizing a human's task of post-trips, but in any event the motor carrier should be responsible for the safe operating condition of the vehicle at all times.
- Motor carrier periodic inspections, including the DOT annual, are viewed to always be a requirement for CMVs, with or without ADS. The importance of PMIs and the safety of transportation is an ATA priority, and even if this entails a 30-minute inspection compared to today's average three-hour inspection, quality and efficiency should continue to improve.

Q7.1. What qualifications should be required of the individual performing the pre-trip inspection?

As ADS technology moves closer to commercial deployment, technology developers and motor carriers will collaborate with FMCSA on the appropriate protocol for pre-trip inspections and requirements for personnel. ATA continues to be supportive of the American Association of

Motor Vehicle Administrators (AAMVA) in regards to these efforts and looks forward to working with them and FMCSA in higher levels of ADS pre-trip qualifications.

Q7.2. What kind of routine or scheduled inspections should be performed and what types of ADS-related maintenance records should be required?

Commercial vehicle inspections for ADS higher levels should remain the same – if not exceed performance values – as of conventional CMVs, however what routine kind they are required by the manufacturer or scheduled by the motor carrier. ADS-related maintenance records are recommended to not exceed the current amount of time for record keeping. ATA's Technology & Maintenance Council (TMC) provides industry recognized best practices for CMV PMIs[15]. 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. TMC is currently in the beginning stages for ADS Level 2 equipment and is expected to continue through Levels 3, 4 and 5. ATA strongly recommends that FMCSA be involved in TMC's activities in defining inspection to be performed on ADS-equipped CMVs.

Q7.3. Should the inspection period be more or less frequent than annual for an ADS-equipped CMV?

The DOT annual inspection is sufficient for Level 4-5 ADS-equipped CMVs. CMVs are inspected as frequently as the truck OEM and component supplier requires, warranting the equipment at such intervals, which is in addition to DOT regulations motor carriers must follow also. As technology has improved, CMVs are currently able to lengthen inspection intervals, decreasing maintenance costs with stable assurance through enhancing component durability over time. This has been improving uptime, motor carrier efficiency, and is viewed to continue to improve with high levels of ADS within the DOT annual inspection.

Q7.4. Should inspections be mileage-based or time-based (e.g., 1,000 miles, 3 months or 1,000 hours of operation)?

CMV inspections should neither be mileage nor time-based, but based on the motor carrier's decided duty cycle to operate ADS-equipped CMVs. ATA's TMC has a long history of perfecting PMIs through motor carrier industry verticals, type of equipment and loads. TMC's Vehicle Maintenance Reporting Standards (VMRS) is an industry recognized tool that, of many uses, configures a CMV PMI based on motor carrier maintenance management. Also, given that ADS-equipped CMVs may operate longer and farther than human drivers, PMI intervals may become dynamically traced—improving a motor carrier's maintenance record. ATA realizes that placing a mileage or time interval on CMV PMIs seems practicable, but suggests that a motor

[15] TMC. (2015). *Preventive Maintenance Inspection (PMI) Guidelines: Class 7 & 8 Diesel Powered Tractors; Light & Medium Duty Vehicles; Trailers & Material Handling Equipment*. Arlington, VA: American Trucking Associations' Technology & Maintenance Council.

carrier's maintenance program experience should not be limited by regulation and rather be regulated by their performance of quality maintenance.

Q7.5. Should FMCSA impose general requirements for motor carrier personnel responsible for ADS-related inspection, repair, and maintenance tasks similar to the Agency's brake inspector qualification requirements?

FMCSA should not impose general requirements for motor carrier personnel responsible for ADS-related inspection, repair, and maintenance tasks, and should not compare requirements to the Agency's brake inspector qualification. Motor carriers keep their maintenance facilities in high regard to any type of equipment in need of repair, and upholds technician skill standards through equipment and component manufacturer continuous training and testing. Additionally, motor carriers rely on the National Institute for Automotive Service Excellence (ASE) certifications for professionalism in any CMV maintenance craft.

ATA and ASE have continuously worked together through TMC's Professional Technician Development Committee in advancing ASE tests and training sessions for ADS-equipped CMVs. Also, the ASE Education Foundation provides accreditation to automotive service technology training programs at high schools and post-secondary institutions, rooting CMV ADSs at beginning stages of technician career paths – an important value in growing industry workforce. TMC is in the process of developing best practices for ADS-related inspection, repair, and maintenance tasks. ATA recommends the Agency to be more involved in TMC's activities in ensuring that motor carrier personnel and third-party technicians have the appropriate information and training to properly maintain ADSs and associated vehicle systems and equipment.

Q7.6. How could FMCSA ensure that motor carriers apply safety-critical software updates?

Motor carriers currently apply CMV software updates daily without FMCSA's assurance. Truck manufacturers and technology suppliers work with their customers frequently in assuring software updates (both non- and safety related) are communicated well during vehicle inspection/repairs and when possible, over-the-air while in operation. Additionally, motor carriers rely on NHTSA's safety notices and recall campaigns for connected issues. ATA does not recommend that FMCSA ensure CMVs in operation to have the latest software updates to every type of CMV and its many onboard ECUs as this may burden motor carriers.

Issue 8: Roadside Inspections

ATA views roadside inspections and unexpected maintenance and operational events most challenging in higher levels of ADS under current regulations which only contemplate human-driven CMVs. Finding solutions is important for safety in an ADS transportation environment. Industry stakeholders (including motor carriers, technology suppliers, and vehicle

manufacturers) and the enforcement community should work together to develop appropriate training and technical procedures to effectively manage ADS-equipped CMVs in operation. It is worthy of note that "ADS-equipped" CMVs are layers of added intelligent technology on foundational systems and components. Commercial vehicles are currently led through redundant safety design requirements, depending on the level of ADS, determining non-compliance and a minimum level of safety should always be present.

Q8.1. Should motor carriers be required to notify FMCSA that they are operating Level 4 or 5 ADS-equipped CMVs?

Motor carriers that operate Level 4 or 5 ADS-equipped CMVs and do not wish to notify FMCSA should not be required to. Such a requirement would not be consistent with DOT's position on being technology neutral, and would unnecessarily burden the industry if required. Unless further study is warranted and proven necessary, this type of notification has no effect on safety for the carrier, public, enforcement, or DOT.

Q8.2. If so, how should the carrier notify FMCSA?

While ATA does not support such a requirement, if FMCSA were to adopt a notification requirement for the operation of ADS-equipped CMVs, the agency could update the MCS 150 form to allow motor carriers to declare if they plan on operating ADS-equipped CMVs.

Q8.3. Should FMCSA require markings identifying the ADS Level of a vehicle?

This question needs additional study, with consideration that the needs may be different for vehicles capable of operating at L3 and below than for those capable of L4 or L5 operation. It should also be noted that while the vehicle may be marked at a certain automation level, it may in fact be operated at a lower level at the driver's sole discretion. While the question posed suggests that other road users may interact unfavorably with vehicles visibly marked to indicate the level of automated operation they are designed to achieve, it is also possible that other road users may react inappropriately should they not be aware that they are interacting with an ADS-equipped vehicle. Should it be determined that visible markings are not advisable given the concern over the interaction with other road users, alternative means should be explored for identifying to enforcement officials the automated capabilities of the vehicle. The issue of marking ADS-equipped vehicles is not specific to CMVs; this is also an issue for passenger vehicles. FMCSA should coordinate with NHTSA to ensure that any requirements for CMVs are consistent where possible with those for passenger vehicles, and should there be unique requirements identified, that these do not cause confusion for law enforcement or other road users. FMCSA could consider that vehicle-to-vehicle and vehicle-to-infrastructure (collectively known as V2X) communication technology could be utilized to transmit information about the ADS level of a vehicle to law enforcement and emergency responders.

Q8.4. Should the Agency require motor carriers to utilize ADS-equipped CMVs that have a malfunction indicator?

The Agency should not require motor carriers to utilize ADS-equipped CMVs that have a malfunction indicator. First, the term "malfunction indicator" needs more description as to how and where on the CMV it is applied. Second, ADS malfunctions are viewed to be complex to the nature of how the indicator may or may not illuminate, if the perceived indicator even has that feature. Third, as ADS-equipped CMVs may become more customary, a malfunction indicator may limit operational safety compliance with better communication technologies to come. Fourth, the Agency should not require motor carriers to be on this question as it relates to how ADS developers and CMV manufactures design their systems.

ATA suggests that TMC, SAE International, and the enforcement community work together in providing flexible bidirectional methods of communication for higher levels of ADS-equipped CMVs.

Q8.5. Should the Agency require that motor carriers deploying ADS-equipped CMVs ensure the vehicle can pull over in response to Federal and State officials or move out of the way of first-responders?

ADS-equipped CMVs should be able to pull over/move out of the way. As the industry moves toward commercial deployment, technology providers will collaborate with FMCSA for appropriate protocols.

Q8.6. How might that be achieved, and at what cost?

ADS developers have engineered and continue to improve solutions for responding to first responders and other Federal and State law-enforcement officials. Examples of solutions include detection of lights and sirens, and potentially vehicle-to-vehicle communications.

Q8.7. How would roadside enforcement personnel know that a vehicle can no longer operate safely?

ADS-equipped CMVs may have access to a number of tools to determine safe operation beyond what human drivers are capable of, this includes numerous self-diagnostic systems and the ability to communicate to a motor carrier in case of safety issues. Roadside enforcement personnel may also be able to make their own determinations of vehicle safety by monitoring erratic behavior, as they do for human drivers, and with potential V2X solutions.

ATA does recommend that terminal inspections for ADS-equipped CMVs would be ideal and mutually beneficial by motor carriers rather roadside.

Q8.8. Absent an FMVSS, how could standard indications be provided to enforcement personnel?

ATA recommends FMCSA to work with TMC in creating best practices. TMC's Automated and Electric Vehicles Study Group was recently created with this objective, and the Commercial Vehicle Safety Alliance has already connected with developing TMC Task Forces for maintenance, repair, and inspection toward ADS-equipped CMVs.

Issue 9: Cybersecurity

ATA commends DOT for interest in ensuring a comprehensive cybersecurity environment for trucking and looks forward to DOT's research results from current projects to improve the cybersecurity posture of motor carriers and their vehicles. ATA supports NIST guidance, the Automotive Information Sharing & Analyses Center (Auto-ISAC, as well as affiliated ISACs), SAE and ISO standards that provide manufacturers the right tools in mitigating cybersecurity risks to overall vehicle safety. ATA's TMC also provides best practices for improving motor carrier cybersecurity, vehicle component risks, and off-board communication vulnerabilities.

ATA has been a leader in trucking transportation security, serving the industry through its multiple conferences and councils on cargo theft, truck theft, vandalism, terrorism, trafficking, and cybersecurity. Through the many services ATA provides the enforcement community and benefits to members and overall industry, ATA's newest security program is Fleet CyWatch. As cybersecurity concerns have grown in recent years, ATA's membership and federal enforcement worked together in initiating Fleet CyWatch that:

- assists stakeholders in reporting cybercrime;
- sends alerts on reported cybercrime;
- manages cyber reporting resources with affected members; and
- collects and distributes up-to-date security information that may affect stakeholders.

ATA Fleet CyWatch is a valuable program for decreasing cyber-attacks on trucking stakeholders and is a cornerstone of advanced collaboration among motor carriers, federal enforcement, and non-government cybersecurity organizations. In addition to Fleet CyWatch, ATA's activities in cybersecurity include:

- ATA's TMC annual cybersecurity conference
- ATA's TMC CyberTech competition, part of the annual TMC SuperTech Competitions
- State Trucking Associations' CyberTech training
- National Motor Freight Traffic Association annual cybersecurity meetings
- The annual CyberTruck Challenge
- Auto-ISAC best practices and events

ATA recommends FMCSA to work with TMC and the ATA Fleet CyWatch program in growing these activities. Finally, ATA encourages FMCSA to always involve other appropriate federal agencies and stakeholders when considering policies for cybersecurity. Cybersecurity is

an all- encompassing topic that requires a cross functional and collaborative work effort that extends beyond the development of ADS.

Q9.1. What types of safety and cargo security risks may be introduced with the integration of ADS-equipped CMVs?

ATA believes that advanced vehicle and facility security technology can be applied to address safety and cargo security risks for ADS-equipped CMVs as well as CMVs without higher levels of ADS. Examples of currently available technologies that may assist in reducing safety and cargo security risks include remote emergency alert features, engine disable/enable functions, real-time asset tracking, speed and geofence monitoring, and remote access (Web, Phone, etc.). Also, ADS-equipped CMVs may be initially deployed in sector specific, load specific, and route specific applications that have been selected by the carrier to reduce potential risks.

Q9.2. What types of rules should FMCSA consider to ensure that motor carriers' safety management practices adequately address cybersecurity?

ATA does not recommend rules for motor carriers that address cybersecurity. Regulating motor carriers for cybersecurity would become an endless variable transitioning standard with limitless burdens to DOT and the industry. Cyber-threats and attacks will continue to find new ways in connected systems and fleet back-office operations without control. ATA suggests organizational network minimum performance evaluations that FMCSA can work with best practices groups, like TMC, in improving industry's utilization of the NIST Cybersecurity Framework.

Issue 10: Confidentiality of Shared Information

ATA commends FMCSA's efforts to ensure the protection of sensitive data as ATA recommended in comments on FMCSA's notice[16], *Request for Comments Concerning Federal Motor Carrier Safety Regulations (FMCSRs) Which May be a Barrier to the Safe Testing and Deployment of Automated Driving Systems-Equipped Commercial Motor Vehicles on Public Roads*. ATA supports vehicle generated data access and ownership through contractual benefit between motor carrier and vehicle supplier, and stands ready to work with the Agency in confidentiality of shared information.

Q10.1. As the development of ADS technology continues, the Agency believes there is a need to learn about the performance limitations of these systems. FMCSA draws a distinction between information about performance limitations (e.g., how well does the ADS keep the vehicle in its lane and under what environmental conditions, etc.) and details about the system design (e.g.,

[16] See Docket# FMCSA-2018-0037

the specific types of sensors, or the arrays of sensors and cameras used for input to the central processing unit for the ADS). To what extent do ADS developers believe performance data should be considered proprietary and withheld from the public?

The operating characteristics of an ADS and the specifics of the ODD in which it is intended to operate will vary based on ADS design and level of automation. FMCSA should work with manufacturers and developers of ADS, as well as motor carriers, to learn more about their systems – as they are in the best position to demonstrate its capabilities – while protecting proprietary information.