FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION
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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

SUBMITTED BY:
American Trucking Associations
950 North Glebe Road
Suite 210
Arlington, VA 22203

Michael Cammisa
Vice President, Safety Policy, Connectivity & Technology
mcammisa@trucking.org

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The American Trucking Associations (ATA)[1] submits these comments to the Federal Motor Carrier Safety Administration (FMCSA) on the agency's *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* (83 Fed. Reg. 12933).

As the national representative of the trucking industry, ATA has a strong interest in highway safety for all motorists. Highways are the motor carriers' and drivers' workplace. Employing more than 7.3 million people and moving 10.5 billion tons of freight annually, trucking is the industry most responsible for moving America's economy. The trucking industry moves 70.1 percent of our nation's domestic surface freight and is a critical player in the safety of our nation's roadways, spending $9.5 billion per year on safety training, technology, equipment, and management.

Automated and connected vehicle technologies have the potential to dramatically impact nearly all aspects of the trucking industry. These technologies can bring benefits in the areas of safety, environment, productivity, efficiency, and driver health and wellness. Automated driving technology is the next step in the evolution of the safety technology currently available, and will help to further improve driver safety and productivity, as well as the safety of other motorists and road users. Automated technology comes in many levels that will assist the driver and, in some cases, handle the driving task. The application of automated and connected vehicle technology in the trucking industry will center on solutions in which there remains a role for drivers, recognizing the duties and requirements drivers have beyond operating the vehicle. At automation levels 4 and 5, where the ADS

[1] ATA is a united federation of motor carriers, state trucking associations, and national trucking conferences created to promote and protect the interests of the trucking industry. Directly and through its affiliated organizations, ATA encompasses over 34,000 motor carriers and suppliers of every type and class of operation in the United States, Canada, and Mexico.

is capable of performing the dynamic driving task without intervention, the role and requirements for drivers and support personnel may differ based on system design and operational procedures.

As noted in our comments filed with National Highway Traffic Safety Administration (NHTSA) in November 2017 regarding *Automated Driving Systems 2.0: A Vision for Safety*, from the trucking industry perspective, 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. The federal government's role in this area precludes any state efforts to regulate vehicle design, as such state efforts would inherently give rise to a conflict with the federal scheme.

ATA shares the Department of Transportation's (DOT's) interest in removing regulatory barriers to facilitate innovation that could bring significant advancements in motor vehicle safety for all road users, and appreciates this opportunity to provide input. Government regulators and lawmakers should revise or remove outdated safety related laws, regulations and guidance as data demonstrates a technology's ability to provide an equivalent or higher level of safety than current regulations support or incorporate. In so doing, proposed policy, regulations, or guidance by government should not pick winners or losers of technology. Government should not create disincentives for investments in future improvement and enhancements to automated and connected vehicle technology. In taking actions to address regulatory barriers to Automated Driving Systems (ADS), FMCSA should look first to use interpretations, guidance and waivers for removing barriers where possible, and use the significantly more time consuming and resource intensive rulemaking process where appropriate.

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 such organizations 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 ADS systems.

To this end, TMC recently established a new Study Group on Automated Vehicles, with the objective to assist in the development and maintenance of durable, reliable, and maintainable systems for automated vehicles. Its scope will include the study of malfunctions, deficiencies, and failures of such systems and investigate future developments in system componentry and accessories. The Study Group shall also conduct surveys, collect data, and monitor testing programs and research of affiliated industry groups in order to develop suitable Recommended Practices that fleet equipment users and manufacturers can follow. This new Study Group will be considering many of the issues that are the subject of these comments.

In sections II and III of the subject Federal Register notice, FMCSA poses specific questions under eleven headings. Following are ATA's comments to those questions, grouped under the same headings.

Inspection, Repair, and Maintenance

1. How should motor carriers ensure the proper functioning of ADS prior to operating in an automated mode?

Proper functioning of ADS should be assessed prior to operation through a combination of pre-trip inspections, system self-diagnostics, or any other relevant inspections or actions recommended by the manufacturer of the ADS. System self-diagnostics should perform a check to ensure that hardware and software components are healthy. Should the self-diagnostic system or other pre-operation assessment identify any faults/malfunctions that could compromise safety in any part of the ADS or in any related system on which the ADS relies, the ADS should not engage until the fault or malfunction is corrected following procedures recommended by the manufacturer.

2. Should the Agency consider minimum requirements for motor carrier personnel responsible for maintaining the equipment used to achieve certain levels of automated operations (for example, a requirement that technicians be trained by the ADS developers, etc.)?

Trucking industry organizations such as the TMC, working with technology providers, component suppliers, truck manufacturers, and motor carriers should develop recommended practices to ensure that motor carrier personnel and third-party technicians have the appropriate information and training to properly maintain ADS and associated vehicle systems and equipment. It is expected that ADS developers will provide information and training for technicians responsible for maintaining ADS. TMC's Professional Technician Development Committee has worked, and will continue to work, closely with the National Institute for Automotive Service Excellence (ASE), the lead organization for technician certification, in development of the necessary curriculum and certifications to provide a trained pool of technicians with the knowledge and skills to maintain and service ADS systems. This cooperation recently led to ASE's updating its certification model to provide for a Master Truck Service Technology certification. TMC is also early in the process of evaluating the needs of practices regarding the maintenance/service facility itself with respect to ADS equipped CMVs.

3. What Information Technology (IT) security/safety assurances can be provided by maintenance personnel and CMV drivers/operators that the ADS systems are functioning properly?

Fleets and their service providers should train employees on company policies and processes appropriate for their role (e.g., driver/operator, maintenance technician) for assuring cybersecurity in company systems and equipment, and what they should do in the event of a known or suspected cybersecurity breach in accordance with manufacturer recommendations and industry best practices. ADS self-diagnostic systems should be sufficient to identify functional deficiencies and or the presence of malware or viruses that may be the result of a cybersecurity intrusion.

4. For State representatives with experience inspecting traditional CMVs, what types of malfunctions or damage on an ADS-equipped CMV should be considered an imminent hazard? Do you have any additional comments regarding inspection, repair, and maintenance?

This issue requires additional study. In the event of a technical deficiency or malfunction in the ADS or primary components of the system, it may be possible to complete the trip/mission using human driver intervention or a redundant backup system. The complexity of the technology may inherently result in there not being a trained and properly equipped service facility nearby. There needs to be distinction of the criteria which result in an Out-Of-Service condition and those which may permit continued operation in either a limited automated or fully manual mode of operation.

Roadside and Annual Inspections

5. How could an enforcement official identify CMVs capable of various levels of automated operation? For example, should CMVs with ADS be visibly marked to indicate the level of automated operation they are designed to achieve, or would making these vehicles so easily identifiable cause other road users to interact unfavorably with CMVs with ADS?

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. 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.

6. Do you have any additional comments regarding roadside and annual inspections?

Industry (including carriers, technology providers, equipment suppliers, and truck manufacturer) and the enforcement community should work together to develop appropriate training for enforcement personnel to effectively inspect ADS-equipped CMVs. A system could be developed with appropriate communication and security protocols so that the information in the ADS self-diagnostic system could provide health status to an enforcement officer's query.

Distracted Driving (Prohibition Against Texting and Using Handheld Wireless Phones) and Driver Monitoring

This section applies to situations involving a Level 3 human-monitored ADS. Current regulations prohibit individuals from texting and using hand-held wireless phones while driving CMVs in interstate commerce.

7. What changes, if any, should be made to the distracted driving regulations for human drivers of CMVs with ADS while in automated mode? For example, should a human driver in a CMV with ADS be allowed to use a hand-held wireless phone while the ADS is in complete control of the vehicle?

Before considering any changes to distracted driving laws, there should be a better understanding of the requirements of the driver/operator in real-world driving conditions for operating the vehicle with the ADS active. 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.

8. Should driver fatigue monitoring be required, and if so, what method(s) should be used to conduct such monitoring? For example, the Trucking Fatigue Meter [See https://pulsarinformatics.com/products/trucking] samples data throughout the day and alerts fleet managers once a human driver exceeds a company-determined fatigue threshold.

A better understanding of the requirements of the driver/operator in real-world driving conditions for operating the vehicle with the ADS active is necessary before determining whether driver fatigue monitoring should be required and by what method it should be performed. This may vary by ADS design, level of automation, and Operational Design Domain (ODD), among other things.

9. Additionally, should these systems be required to provide "alertness assistance" to human drivers? For example, should these systems be required to periodically request input from human drivers, or should they be required to request input from human drivers only when the driver appears to be losing focus or when the ADS in control of the vehicle is confronted with situations outside its parameters?

In an L3 or below ADS in which the driver/operator is expected to be the fallback for handling the dynamic driving task, it is important to ensure that the fallback-ready user is receptive to an ADS-issued request to intervene within a certain defined time in case of a vehicle system failure or exit from the ODD. One method to address this could be to implement an "alertness system"; however, there are other technical and training approaches that could achieve the same goal. Any requirements in this area should be flexible to allow alternative approaches to achieving the desired outcome and not proscribe a specific method or technology.

10. What level of human driver inattentiveness (or how long a period of inattentiveness) should be allowed in a vehicle controlled by an ADS before the vehicle is required to enter its minimal risk condition? How long after entering the minimal risk condition must a human driver wait to re-engage an ADS (e.g., a minimum 30-minute break may provide the driver an opportunity to rest)? What should the requirements be for re-engaging the CMV with ADS in an automated mode in this scenario?

A better understanding of the requirements of the driver/operator in real-world driving conditions for operating the vehicle with the ADS active and how drivers/operators would respond to the potential vehicle interventions is necessary before determining specific parameters for the situations identified in this question. Requirements may vary based on ADS design, level, and capabilities.

Medical Qualifications

11. What medical conditions currently precluding issuance of a medical card could become inapplicable as ADS technology develops?

At L3 and below, ADS technology in CMVs will primarily assist the driver and in some cases handle the driving task under certain conditions and 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. 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.

12. What medical conditions currently precluding issuance of a medical card should NOT be considered disqualifying for a human driver who is simply monitoring a CMV with ADS?

See answer to question 11 above.

Hours of Service for Drivers

13. FMCSA's regulations include requirements intended to reduce the risk of driver fatigue and fatigue-related crashes. Generally, the rules for truck drivers allow up to 11 hours driving time in the work day, following 10 consecutive hours off-duty. And all driving must be completed within 14 hours of the beginning of the work day. The rules prohibit driving after a driver has accumulated a certain amount of on-duty time (which includes the time spent driving and time spent performing other work) during the work week. Current regulations require that all time spent at the operating controls of the CMV be recorded as on-duty, driving time. Given the SAE levels of automation discussed above, FMCSA seeks public comments on how drivers' hours of service should be recorded if the ADS is relied upon to perform some or all of the driving tasks.

This is an important consideration deserving of study. The level of effort required by the driver/operator will vary with the automation level, the design of the ADS, and the amount of time the vehicle is able to operate at a particular level of automation given the route and conditions the driver/operator is experiencing on a given day. Research should be undertaken to examine fatigue and attentiveness/inattentiveness experienced by drivers of ADS-equipped vehicles to determine what modifications to HoS rules for drivers of ADS-equipped vehicles would be appropriate. HoS rules should apply only to human drivers and not to an ADS.

Commercial Driver's License (CDL) Endorsements

14. Should an endorsement be considered for human drivers and operators of CMVs with ADS to ensure they (1) understand the capabilities and limitations of the advanced technologies, and (2) know when it is appropriate to rely on automatic rather than manual operation? If so, what

types of tests—knowledge, skills, or both—should be required to obtain such an endorsement; and should there be separate endorsements for different types of ADS?

At the present time, a specific CDL endorsement does not seem appropriate as the capabilities and limitations of an ADS may vary based on system design, even for ADSs operating at the same level of automation. Motor carriers in concert with the CMV manufacturer or technology company supplying the ADS should maintain responsibility for ensuring proper training for drivers/operators of ADS-equipped CMVs. As the technology matures, there could be sufficient commonality of ADS to enable a standardized test for an endorsement in the future, but this should be studied to identify the need and/or benefit of such an endorsement, which may be different for different levels of automation. Should a CDL endorsement be required, consideration must be given to allow a driver to operate an ADS-equipped CMV using manual driver controls without engaging the ADS, if he/she does not have the appropriate CDL endorsement to operate an ADS.

15. If an ADS-equipped CMV is to be deployed without a human driver onboard, should the computer system be required to demonstrate autonomous capabilities for the same maneuvers included on the CDL skills test?

Any requirements for an ADS to demonstrate its capabilities should be developed at the federal level by FMCSA and NHTSA, with input from industry and other stakeholders. Any new requirements for ADS should be technology neutral and provide flexibility that will allow for different design concepts and future innovations. Any requirements should leave flexibility for an ADS to be designed for specific purposes or narrow ODDs, and not require that an ADS meet requirements unrelated to its actual uses.

Data Sharing

16. If you are a developer or tester of ADS technologies, what types of data and/or safety measures are you currently collecting—or do you plan to collect—during testing? How often is this data collected?

N/A

17. How can FMCSA ensure that data and/or safety measures collected are presented in a comparable format?

FMCSA in coordination with NHTSA, NTSB, TMC, and SAE International should investigate the feasibility of the creation of reliable data parameter standards for accident reconstruction purposes without compromising proprietary data and that would be applicable regardless of system design or technology used. In any proposal for data gathering, consideration should be given to ensure that:

- Vehicle owners and operators are properly protected against the use of electronically generated data in regulatory enforcement and civil litigation;
- Data are anonymous and used for safety research and trend analysis by a single lead agency or institution;
- Reasonable privacy can be assured regarding access and use of the information;
- Access to data is controlled;
- Data are recorded only for a limited period of time relative to an event; and

- There is no burden on individual vehicle owners or operators for the reporting or collection of such data at any time.

18. How can FMCSA assess whether a CMV equipped with an ADS is being operated as safely as a traditional CMV operating on a public roadway?

To operate on public roadways, ADS-equipped vehicles must meet existing federal standards for CMVs or requirements for any applicable waivers or exemptions. As with any CMV, safe operation is assessed by on-road observation and evaluation.

19. What pieces of information are entities using to evaluate how a driver is using an ADS- equipped commercial vehicle?

N/A – for individual companies to respond.

Testing and Interstate Operations of CMVs With ADS on Public Roadways

20. What type of ADS-equipped CMVs are currently being tested? Are they Level 4 ADS-equipped vehicles that can only operate on certain roadways, Level 4 vehicles with more extensive ODDs, or full Level 5 vehicles?

N/A – for individual companies to respond

21. Do vehicles currently being tested have operational limitations to ensure safe operations? Examples of operational limitations might include time of day, weather conditions, types of roads, specific routes within an ODD, maximum allowable operational speed, markings showing that the vehicle is capable of highly automated operations, etc.

N/A – for individual companies to respond

22. In moving forward what actions, if any, should FMCSA consider to ensure the safe operation of ADS-equipped CMV's in various ODDs?

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. Manufacturers/developers are in the best position to demonstrate the capabilities of their ADS systems. Further study and information is required before a federal agency such as FMCSA and/or NHTSA could determine the feasibility of identifying generalized parameters to assess ADS performance.

23. How can FMCSA assess whether a CMV with ADS operating within its ODD can perform on certain maneuvers, such as emergency brake performance, crash avoidance maneuvers, etc.?

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. Manufacturers/developers are in the best position to demonstrate the capabilities of their ADS systems. Further study and information is required before a federal agency such as FMCSA and/or NHTSA could determine the feasibility of identifying generalized parameters to assess ADS performance.

24. Should FMCSA consider approaching CMVs that carry persons or hazardous materials differently than other CMVs?

See comments filed by ATA in response to the Pipeline and Hazardous Materials Safety Administration (PHMSA) on their *Request for Information on Regulatory Challenges to Safely Transporting Hazardous Materials by Surface Modes in an Automated Vehicle Environment* (83 Fed. Reg. 13464, Docket No. PHMSA-2018-0001.

25. For State representatives, would you consider changing certain requirements (for example, higher versus lower levels of insurance) for an ADS-equipped CMV? If yes, based on what factors; and how would you implement such requirements?

N/A

Beyond Compliance Program

On April 23, 2015, FMCSA issued an initial Federal Register notice seeking comment on the impacts of a possible "Beyond Compliance Program" to consider a company's voluntary implementation of state-of-the-art best practices and technologies when evaluating a carrier's safety (80 FR 22770). The Fixing America's Surface Transportation (FAST) Act mandated that the Agency provide recognition to motor carriers for voluntary use of advanced technologies or safety programs (Pub. L. 114-94, 129 Stat. 1312, Dec. 4, 2012). Per section 5222, FMCSA may authorize qualified entities to monitor motor carriers that receive "Beyond Compliance" recognition (129 Stat. 1540).

26. To what extent, if any, should the various levels of automation be considered as part of the Beyond Compliance Program?

Investing in advanced technologies by a motor carrier, including any level of ADS, shows their interest in performing at high levels of safety beyond the standard required for compliance. The FMCSA should recognize motor carriers that adopt innovative safety technology and adjust its enforcement priorities appropriately.

Regulation of Manufacturing Versus Operation

27. The regulation of CMVs is a function shared by the National Highway Traffic Safety Administration (NHTSA) and FMCSA, with manufacturing regulated by NHTSA and operation regulated by FMCSA (and its State partners). Does this separation of functions create unique problems, or perhaps offer unique solutions, for operators of ADS-equipped CMVs?

A federal solution is key for future deployment, and should include coordination of policies and regulations across all relevant agencies. The regulation of performance and technical specifications of automated and connected truck technology should be solely the responsibility of the Federal government.

The trucking industry relies on an interstate highway system that facilitates the free flow of goods between the states. As automated truck technology is developed, tested, and commercialized, it is critical that federal, state and local laws do not create disparities that limit commerce and obstruct the successful adoption of these potentially safety- and productivity-boosting technologies.

States should maintain their existing responsibilities that do not interfere with the flow of interstate commerce. In the absence of federal regulation, states should support operations of commercial motor vehicle automated and connected technologies within their rights of intrastate jurisdiction.

States should commit to ensuring a unified national framework to facilitate the development, testing, and deployment of commercialized automated and connected truck technology, including further harmonization of state-level traffic and vehicle rules affecting the operation of such technology. Currently having states that allow L4 testing is key because they allow developers to train their systems while monitored by a safety driver. However, the absence of consistent state laws could result in a situation where operation of an ADS-equipped CMV across state lines would not be possible, slowing the development and deployment of ADS technology.

Confidentiality of Shared Information

FMCSA acknowledges that companies may be reluctant to share certain proprietary data or information with the Agency, either as part of the waiver, exemption, or pilot program application process, or during the pendency of a regulatory relief period. The Agency notes that 49 CFR 389.3 provides protection for "confidential business information" which includes trade secrets or commercial or financial information that is privileged or confidential, as described in 5 U.S.C. 552(b)(4). Commercial or financial information is considered confidential if it is voluntarily submitted to the Agency and constitutes the type of information not customarily released to the general public. FMCSA has established standards and procedures by which the Agency will solicit, receive, and protect confidential information from public disclosure. The Agency is seeking information from interested parties on how it might further protect non-public information necessary to assess whether ADS-equipped CMVs meet performance standards and accurately document safety-related events during a waiver, temporary exemption, or pilot program.

28. What measures would original equipment manufacturers and developers expect of FMCSA before sharing confidential business information?

OEMs and developers currently supply confidential business information to NHTSA using the following process. The sensitive information is labeled as confidential and submitted to the NHTSA Office of General Counsel. Once the data is reviewed by NHTSA General Counsel and confidential business information status is granted, then the information is given to NHTSA to review, but the information is not placed in the docket or made public. We would expect that FMCSA would follow, at minimum, an equivalent process.

29. How might the Agency obtain information sufficient to assess the safety performance of CMVs with ADS without collecting confidential business information?

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. Manufacturers/developers are in the best position to demonstrate the capabilities of their ADS systems. FMCSA should work with individual

carriers, manufacturers and developers of ADS to learn more about their systems, while protecting proprietary information.

30. Do you have any additional comments regarding the confidentiality of shared information?

No.

Conclusion

ATA supports the development of automated vehicle technology for all vehicle types. This technology has the potential for improving safety, the environment, reducing congestion, and saving fuel. Because higher level ADS technology is currently in the development and testing phase, ATA encourages FMCSA to keep this docket open and to continue dialog with ADS developers and motor carriers to stay informed of the capabilities of the technology and the potential operational changes it may enable. As the technology matures, we look forward to working with FMCSA to identify regulatory barriers that could prevent testing and ultimately deployment, as well as opportunities to adjust regulations to enable all the potential safety and operational benefits that ADS can provide.