ADVOCATES FOR HIGHWAY & AUTO SAFETY

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Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles
Advanced Notice of Proposed Rulemaking
84 Federal Register 24449, May 28, 2019

Advocates for Highway and Auto Safety (Advocates) files these comments in response to the Federal Motor Carrier Safety Administration's (FMCSA, Agency) advanced notice of proposed rulemaking (ANPRM, Notice) seeking public comment on Federal Motor Carrier Safety Regulations (FMCSRs) that may need to be amended, revised, or eliminated to facilitate the introduction of automated driving systems (ADS) equipped commercial motor vehicles (CMVs).[1]

Safety Must Remain the Agency's Highest Priority

Pursuant to federal law, the FMCSA is required to make safety its highest priority:

> *In carrying out its duties, the Administration shall consider the assignment and maintenance of safety the highest priority, recognizing the clear intent, encouragement, and dedication of Congress to the furtherance of the highest degree of safety in motor carrier transportation.*[2]

This charge must be at the forefront of discussions regarding any amendment, revision, or elimination of the FMCSRs. Moreover, it is important to note that the FMCSRs are by definition minimum safety standards.[3] Thus, any reduction in their effectiveness leaves CMV operators and the public that shares the road with them without even a minimal level of protection from risk.

In the Notice, the FMCSA requests comments on the Agency's oversight goals, ten specific areas of current safety rules, the use of voluntary consensus standards and the administration of the Motor Carrier Safety Assistance Programs (MCSAP). Advocates has already submitted comments to the recent notice from the National Highway Traffic Safety Administration (NHTSA) on the removal of

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[1] Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles, Advanced Notice of Proposed Rulemaking, FMCSA, 84 FR 24449, May 28, 2019, FMCSA-2018-0037. (Notice)
[2] 49 U.S.C. 113, Federal Motor Carrier Safety Administration.
[3] 49 U.S.C. 31136.

regulatory barriers for vehicles with ADS.[4] When applicable, these comments will reference arguments made in those prior comments.

FMCSA's Safety Oversight Goals

FMCSA's statement in the current Notice that *"[g]enerally, 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 time"*[5] is not supported by current research or the results of the investigations of crashes that have already occurred involving vehicles equipped with ADS.[6] Human operators with the appropriate valid commercial driver's license (CDL) must continue to be in the cab of any CMV including those vehicles equipped with ADS. However, CMVs with ADS pose particular and substantial safety concerns that necessitate additional operating requirements in order to protect public safety. In its final report on the 2016 crash involving a Tesla operating on "Autopilot", the National Transportation Safety Board (NTSB) concluded that the operational design of the Tesla "Autopilot" system contributed to the cause of the crash.[7] Another very similar crash occurred March 1, 2019, which the NTSB is also investigating.[8] Based on these incidents and other crashes involving vehicles with various levels of automation, it is premature for the FMCSA to conclude that simply having a licensed driver behind the wheel of these systems is sufficient to avoid crashes caused in part by the unique characteristics of the technology. More importantly, any system which would rely on a human driver as a fall back or to monitor performance of the system presents significant safety issues. The NTSB has documented research which illustrates that "human drivers have cognitive limitations that make fulfilling this responsibility difficult because people are poor at monitoring automation and do not perform well on tasks requiring passive vigilance."[9] These deficiencies could be worsened due to the acute and cumulative fatigue already experienced by CMV drivers.[10]

NHTSA must establish standards for existing, proven, safety technologies for CMVs including systems such as automatic emergency braking (AEB), lane departure warning, and lane keeping assist. In 2015, the NHTSA granted a petition for rulemaking filed by Advocates and others to require AEB on all CMVs with a gross vehicle weight rating (GVWR) of 10,000 pounds (lbs.) or more. Unfortunately, the agency has not undertaken any further regulatory actions since then.[11] These technologies and others can prevent crashes, injuries and fatalities now as automated vehicle

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[4] Advocates for Highway and Auto Safety, Public Comments, Removing Regulatory Barriers for Vehicles With Automated Driving Systems, Advanced Notice of Proposed Rulemaking, NHTSA, 84 FR 24433, May 28, 2019, NHTSA-2019-0036. (Advocates' Comments to NHTSA ANPRM).

[5] Notice, p. 24451.

[6] List of crashes involving autonomous vehicles compiled by Advocates (attached as Appendix A).

[7] Collision Between a Car Operating With Automated Vehicle Control Systems and a Tractor-Semitrailer Truck Near Williston, Florida, May 7, 2016, NTSB, Accident Report NTSB/HAR-17/02, Sep. 12, 2017.

[8] Preliminary Report, Highway, HWY19FH008.

[9] Collision Between a Car Operating With Automated Vehicle Control Systems and a Tractor-Semitrailer Truck Near Williston, Florida, May 7, 2016, NTSB, Accident Report NTSB/HAR-17/02, Sep. 12, 2017; p. 34.

[10] National Transportation Safety Board, 2019-2020 Most Wanted List of Transportation Safety Improvements.

[11] Federal Motor Vehicle Safety Standard; Automatic Emergency Braking, Grant of Petition for Rulemaking, NHTSA, Oct. 16, 2015, 80 FR 62487.

(AV) technology continues to develop. In fact, many of these systems, which will benefit human driven vehicle operations now, are also foundational technologies for AVs. As such, the Agency's assumption that revisions to the FMCSRs would not be necessary for Levels 1-3 equipment is misguided.

Similarly, FMCSA's stated course of action to "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"[12] is insufficient to protect public safety. Voluntary guidance and best practices are unenforceable, have no mechanism to guarantee compliance, and are not equivalent to regulations which require that all actors meet minimum safety standards. The fact that the Agency notes that these systems "may present issues not present in more traditional vehicles"[13] is an indication that the Agency is aware that problems will likely arise simply as a result of the introduction of these new systems. Therefore, the FMCSA must work to establish safety regulations governing the operation of automation systems of all levels to ensure that the introduction of these technologies does not degrade safety on our Nation's highways. Anything less would be an abrogation of the Agency's duty to protect public safety.

Moreover, there is no basis for the Agency's prediction that:

> *Where ADS technology is operating the vehicle within its ODD [operational design domain], FMCSA expects that the ADS will be capable of safely maintaining control of the CMV without the need for human intervention and that in the event of a malfunction, the ADS would be designed and equipped to revert to a fail-safe condition.*[14]

Currently there are no regulations governing the operation of ADS, let alone requirements for them to detect and remedy malfunctions and have a fail-safe condition. FMCSA should not base any proposed changes to the FMCSRs on unfounded expectations. Instead, much of the changes considered by the FMCSA to the FMCSRs should be addressed through strong Federal Motor Vehicle Safety Standards (FMVSS), including a manual override standard should the system fail.

Finally, the FMCSA specifically requested comment on "whether there are CMV types/configurations or cargoes for which fully automated operations should be restricted or prohibited."[15] As noted above, unproven and suspect autonomous driving features for all types/ configurations and cargoes should not be permitted to operate on our Nation's roads until public safety can be ensured. As the NTSB report on the 2016 Tesla crash has indicated, the design of these systems can contribute to the cause of a crash, a fact which would only be exacerbated by allowing such systems on CMVs which carry weights of up to 80,000 pounds or more, hazardous materials or passengers. The FMCSA and the NHTSA should not rush to modify or eliminate existing rules to speed the introduction of these systems to the market in the absence of federal regulations, a demonstrated safety benefit and proven performance.

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[12] Notice, p. 24451.
[13] *Id.*
[14] *Id.*
[15] Notice, p. 24452.

Discussion of Current Safety Rules

In the Notice, FMCSA discusses current safety rules and responses to an earlier request for comments by dividing the discussion into ten general questions. These comments will address each of these areas individually. As a preliminary matter, the Agency is correct in stating that "individuals responsible for taking control of an ADS-equipped vehicle on a public road should be subject to the current driver-related rules."[16] The FMCSRs become no less important or applicable simply because a CMV has been equipped with an autonomous driving system.

1. Do the FMCSRs require a human driver?

The FMCSA states that "[b]ecause the regulations do not require the presence of a human driver or operator, FMCSA will interpret its regulations to no longer assume that the CMV driver is always human or that a human is present onboard a commercial vehicle during its operation."[17] This statement by the FMCSA is not only ill-advised, but it also could result in adverse consequences to public safety. As noted in Advocates' recent comments to NHTSA, allowing the ADS to be interpreted as the driver will likely undermine the safety need met by various standards.[18] Determinations of when and where it might be appropriate to allow the ADS to be interpreted as the driver, rather than a human, should only be done through a rigorous rulemaking process. Again, amending the general definition of the terms "driver" and/or "operator" without regard for the impacts this could have on the safety need met by the various regulations presents significant safety concerns.

FMCSA also specifically asks if the Agency should "establish a rule that would prohibit an ADS-equipped CMV from operating outside its designated ODD."[19] Such a rule should be part of an FMVSS governing the operation of ADS in all vehicles. The ODD must be established as the conditions under which an ADS can operate safely and these systems must be required to be designed so as to not operate outside of these boundaries. The NHTSA must test the ADS of a CMV to ensure compliance.

2. Commercial Driver's License (CDL) Endorsements

The FMCSA is correct in stating that "[t]he Agency believes that any individual who is expected to control the ADS-equipped CMV at any time the vehicle is in operation on a public road must be fully qualified to do so" and "the Agency is inclined to maintain the CDL rules essentially as written, but to clarify that these rules apply to any person who may be relied upon to control any aspect of operation of the ADS-equipped vehicle on a public road."[20] However, it is essential that the Agency establish "uniform knowledge and/or skills tests to adequately assess a CDL holder's understanding of the vehicle's ADS and the specific operating scenarios under which human control

[16] Notice, p. 24452.
[17] Notice, p. 24453.
[18] Advocates' Comments to NHTSA ANPRM.
[19] Notice, p. 24453.
[20] *Id.*

may be needed, versus those where relying solely on the ADS is appropriate" and not refuse to do so because it would be "difficult".[21] As noted previously, the NTSB has already demonstrated how poor design can impact a driver's tendency to over-rely on automation, sometimes with deadly results. It is unacceptable for the FMCSA to recognize that these systems may increase risk because of driver misuse or lack of training and provide no plans for addressing these known problems other than to rely on voluntary guidance. The NHTSA should establish FMVSS for the functional safety of ADS including that the ADS must be able to recognize and respond (through braking) to all foreseeable hazards within the verified ODD. Moreover, the FMCSA should require that CMV drivers are adequately trained and informed on these systems, including a minimum number of behind-the-wheel training hours, to prevent a needless increase in risk to the public.

Drivers seeking to operate an ADS equipped vehicle should be required to obtain a separate endorsement to their CDL. Such an endorsement should be predicated on the creation of FMVSSs specifically for the operation of ADS. This training and endorsement should cover, at a minimum, those aspects of the human machine interface and operation of an ADS-equipped CMV which could increase risk of a crash or safety critical event during operation of the vehicle.

With respect to remote operators of ADS-equipped CMVs, FMCSA in combination with NHTSA should first establish that remote operations of ADS-equipped CMVs can be done safely. Until the agencies can reach such a conclusion, remote operations should not be permitted. Each remote operator should be responsible for only one remotely operated vehicle and be subject to the requirements of all CMV drivers until overseeing multiple vehicles is proven to be done safely. The Agency should not undertake any changes to current requirements of having a licensed CMV driver behind the wheel until all critical aspects of these proposals can be thoroughly evaluated. For example, the Agency must establish rules and enforcement mechanisms to ensure that a remote operator is licensed, rested and in compliance with all applicable FMCSRs.

3. Driver's Hours of Service (HOS) Rules

The agency is correct in concluding that "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."[22] The FMCSA should also specify that any time a driver is required to monitor, or be available as a fall back, or for any other reason, to take over the driving task; this should be counted as on-duty driving time. Only when a driver has no responsibility whatsoever for monitoring or being available to take over the driving task should any status other than on-duty driving be considered. Unless proven otherwise, all drivers, in the cab or operating remotely, should be held to the HOS which are intended to combat fatigue related causes of crashes. Fatigue does not disappear simply because one is operating a vehicle remotely or is monitoring the operation of the ADS-equipped vehicle in the cab, as both must be alert and available to take over the operation of the vehicle. The FMCSA must study the possible implications for fatigue and

[21] *Id.*
[22] Notice, p. 24454.

NHTSA must establish a FMVSS to ensure safe and efficient driver re-engagement into the driving task.[23]

4. Medical Qualifications for Human Operators

FMCSA is also correct in determining that "individuals responsible for taking control of an ADS-equipped vehicle on a public road should be subject to current physical qualification standards."[24] As such, the FMCSA should not weaken these requirements. Additionally, FMCSA should reinstate and complete the rulemaking issued in 2016 to address the safety risks posed by CMV drivers who are afflicted with obstructive sleep apnea (OSA).[25] Compelling and consistent research has revealed that drivers afflicted with OSA that is not properly treated are more prone to fatigue and have a higher crash rate than the general driver population. Yet, in August of 2017 the FMCSA withdrew the rulemaking without providing any credible analysis or reasoning for such an ill-advised course of action.[26]

5. Distracted Driving and Monitoring

FMCSA's inclination "to believe it will remain appropriate to require human operators to comply with all existing regulations concerning distraction while operating ADS-equipped CMVs" is similarly well founded.[27] This should be the rule for all operators who are required to monitor system performance and are required to take over control of the ADS-equipped vehicle at any time whether they are physically in the cab or operating remotely. The Agency must consider the difficulties with enforcement which could be posed by changes to the current regulation. Additionally, a FMVSS for driver re-engagement must be established by a date to assure that the driver is alert and available to re-engage when necessary.

6. Safe Driving and Drug and Alcohol Testing

FMCSA is also correct in stating "that these rules [controlled substances and alcohol testing, and requirements for and prohibitions against certain actions of CMV drivers] should continue to apply to any human who is expected to take control of the operation of the ADS-equipped CMV while it is on a public road."[28]

ADS-equipped CMVs should be held to the same standards governing operations and requiring compliance with the laws, ordinances, and regulations of the jurisdiction in which the CMV is being operated. These rules should be developed as part of a comprehensive FMVSS governing the operation of the ADS that includes requirements that the vehicle be functionally safe within its

[23] Collision Between a Car Operating With Automated Vehicle Control Systems and a Tractor-Semitrailer Truck Near Williston, Florida, May 7, 2016, NTSB, Accident Report NTSB/HAR-17/02, Sep. 12, 2017; p. 34.
[24] Notice, p. 24454.
[25] 81 FR 12642 (Mar. 10, 2016).
[26] 82 FR 37038 (Aug. 8, 2017).
[27] Notice, p. 24454.
[28] Notice, p. 24455.

ODD and that operation of the ADS outside the ODD be prohibited by design. FMCSA should also require that the operation of the CMV, regardless of the driver being human or an ADS, comply with all applicable laws, ordinances, and regulations.

7. Inspection, Repair, and Maintenance

While FMCSA is correct in stating that motor carriers must have appropriate inspection, repair and maintenance programs, and that carriers should have a means of ensuring they are using the most up-to-date version of safety-critical software, FMVSS regulations regarding the operation of ADS should be established to address a number of the concerns and questions raised in the present notice. For example, ADS should be required to have self diagnostics and be designed such that the ADS will not operate unless it is able to do so safely. While pre and post-trip inspections will continue to be critical to ensuring safe operations, no ADS should be able to operate unless it can be assured to operate with the same level of safety with which it was originally designed and was required by regulation. In addition, a certification process must be established for motor carrier personnel responsible for ADS-related inspection repair and maintenance.

Furthermore, it is anticipated that updates will be made to AV systems over the air that may change the functionality, capabilities and operational design domain of the vehicle. An over-the-air update standard must provide that drivers and carriers be given timely and appropriate information and training on the details of the update. Safety upgrades should not be optional or require additional expenses. Also, during the update process cybersecurity must be maintained.

8. Roadside Inspections

As the FMCSA points out, in many cases as it relates to items of motor vehicle equipment, the FMCSRs generally reference the FMVSS. As such, regulations specifically addressing the safety operation of ADS must be established. The Agency cannot rely on voluntary compliance with guidance and expectations that manufacturers or carriers will voluntarily conduct thorough safety assessments. Voluntary compliance is especially vulnerable to abuse and non-compliance in the face of other market pressures. The FMCSA should encourage the NHTSA to undertake rulemakings to ensure the safe operation of ADS. Specific FMVSS for ADS should also require that these systems respond accordingly to enforcement or emergency vehicles. Federal regulations which require self diagnostics and prevent an ADS from operating unless it is physically capable of doing so would address several of the concerns raised by FMCSA in this section, including the need to train enforcement officials on the operation of each ADS.

9. Cybersecurity

Cybersecurity is a universal concern with respect to ADS equipped vehicles. Thus, the adoption of strong cybersecurity requirements through FMVSS is critical to ensuring the safe operation of these vehicles and public safety. ADS-equipped CMVs are a ripe target for cybersecurity-based theft and hacking. Sadly, these vehicles could also be weaponized in a deliberate attack, as has already

occurred with traditional CMVs.[29] It is deeply concerning that the FMCSA repeatedly defers to "encouragement" as opposed to promulgation of rules in this crucial safety area as well as others noted above.

10. Confidentiality of Shared Information

While private consumer information must be protected, it is necessary that data reflecting the performance of ADS be collected, standardized, shared and disseminated to the greatest extent possible to identify safety problems and improve this new technology. The agency should adopt the presumption that on-road performance data of ADS-equipped CMVs is public unless it can be demonstrated to be confidential. The U.S. Department of Transportation (U.S. DOT) must establish a means for reporting all crashes involving ADS-equipped vehicles to allow researchers to study the performance of the technology and assure that unnecessary risks are not being introduced by these technologies or their operation.

Voluntary Consensus Standards

Wholesale reliance on voluntary standards, as these standards are often created by associations and organizations dominated by members of the regulated industry, are woefully inadequate to protect public safety. Instead, the agency must undertake independent rulemakings, subject to public comment, to ensure that all interested parties can provide input and have their opinions considered.

Conclusion

Advocates is opposed to any amendment, revision or elimination of FMCSRs which could undermine safety and needlessly increase risk. The concerns raised by the FMCSA regarding modifying the FMCSRs should be addressed by the development of strong FMVSS for the safe design and operation of ADS. Public safety would best be served by the U.S. DOT promulgating needed rules requiring that all manufacturers are meeting minimum safety requirements and that all road users are afforded the same levels of protection.

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[29] Terror Attack Kills 8 and Injures 11 in Manhattan, Mueller, B., Rashbaum, W., Baker, A., The New York Times, Oct. 31, 2017.

Appendix A

ADVOCATES FOR HIGHWAY & AUTO SAFETY

Crashes and Failures Involving Vehicles Equipped with Autonomous Driving Systems: Public Roads Serving as Proving Grounds and Endangering All Road Users

Problems Continue to be on Tragic Display and Uncertainty is Still Abound as the National Transportation Safety Board (NTSB) has Several Open Investigations

March 1, 2019, Delray Beach, FL, Tesla Model 3: Driver killed when his vehicle, operating on "Autopilot," crashed into the side of a truck tractor combination, traveling underneath the trailer. (NTSB Investigation HWY19FH008)

Photo Source: NTSB

May 29, 2018, Laguna Beach, CA, Tesla Model S: A Tesla reportedly in "Autopilot" crashed into a parked Laguna Beach Police Department Vehicle. The Tesla driver suffered minor injuries.

Photo Source: LA Times

March 23, 2018, Mountain View, CA, Tesla Model X: While on "Autopilot", the vehicle struck a safety barrier, causing the death of the driver. (NTSB Investigation HWY18FH011)

Photo Source: Forbes

March 18, 2018, Tempe, AZ, Uber Self-Driving Test Vehicle: The Uber vehicle, which was operating on "self-driving mode," struck and killed a pedestrian walking a bicycle. (NTSB Investigation HWY18MH010)

Photo Source: NBC News

January 22, 2018, Culver City, CA, Tesla Model S: The Tesla, reportedly on "Autopilot," was traveling at 65mph when it crashed into the back of a parked fire truck that was responding to the scene of a separate crash. Remarkably, neither the driver nor the first responders were injured. (NTSB Investigation HWY18FH004)

Photo Source: Culver City Firefighters

November 8, 2017, Las Vegas, NV, Driverless Shuttle Bus: A driverless shuttle was involved in a crash during its first day of service. Fortunately, there were no deaths or injuries. (NTSB Investigation HWY18FH001)

Photo Source: Fox5 Vegas

May 7, 2016, Williston, FL, Tesla Model S: Driver killed when his vehicle, operating on "Autopilot," crashed into the side of a truck tractor combination, traveling underneath the trailer. (NTSB Investigation HWY16FH018)

Photo Source: NTSB