

August 28, 2019

The Honorable Raymond P. Martinez
Administrator
Federal Motor Carrier Safety Administration
1200 New Jersey Avenue SE
Washington, DC 20590

**Re: Request for Comments Concerning Federal Motor Carrier Safety Administration
Advanced Notice of Proposed Rulemaking: Safe Integration of Automated Driving
Systems-Equipped Commercial Motor Vehicles, Docket No. FMCSA-2018-0037; posted
5/28/2019**

Dear Administrator Martinez:

On behalf of TechFreedom and the R Street Institute, we respectfully submit these comments in response to Federal Motor Carrier Safety Administration's request for comments on its advanced notice of proposed rulemaking, "Safe Integration of Automated Driving Systems-Equipped Commercial Motor Vehicles."¹

TechFreedom is a post-partisan think tank dedicated to promoting the progress of technology that improves the human condition, R Street is a free-market think tank with a pragmatic approach to public policy challenges. Together, we applaud FMCSA for this particular effort to curb regulatory barriers impeding the promise of automated systems, while acknowledging potential risks and unintended consequences that could result from such capabilities.²

Exciting developments are underway in the commercial trucking industry that promise enhanced safety, efficiency, and reliability. Even today, Automated Driving Systems ("ADS") installed in commercial motor vehicles ("CMVs") show promise as tools for crash-reduction. In light of these developments, the Federal Motor Carrier Safety Administration's ("FMCSA") decision to review its regulations ("FMCSRs") to ensure that innovation is given the maximum opportunity to improve the safety of the nation's roads could not be occurring at a better time.

¹ FMCSA, 84 FR 24433 (May 28, 2019)[hereinafter "FMCSA ANPRM"], *available at*, <https://www.federalregister.gov/documents/2019/05/31/2019-11387/safe-integration-of-automated-driving-systems-equipped-commercial-motor-vehicles-correction>.

² *See, e.g.* Ian Adams & Caleb Watney, R Street Institute, *Mr. Nader Misses the Mark on Driverless Cars*, WSJ (Aug. 30, 2018), *available at* <https://www.wsj.com/articles/mr-nader-misses-the-mark-on-driverless-cars-153564947>, ("An additional safety issue with self-driving vehicles is the effect an outage of cellular or GPS service would have on them and those around them. Will there be highways cluttered with thousands of inoperable vehicles? What will it cost and who will pay for this?").

I. Federal Motor Carrier Safety Administration

The FMCSA is the U.S. regulator of trucking safety and operation. It is responsible for ensuring that the semi-trucks ubiquitous on the nation's highways are safely integrating automated technologies. We believe there are four areas in which FMCSA should contemplate specific rule-changes, and our comments address each:

1. Ensure that Commercial Driver's Licence ("CDL") requirements reflect the ADS-context in which a CDL driver is in operation;
2. Adjust Hours of Service ("HOS") requirements to the nature of the assistance a driver is receiving;
3. Integrate cybersecurity principles, like NIST's Cybersecurity Framework, into connected CMVs;
4. Ensure that new FMCSRs are tied to outcomes and not specific technologies.

In light of recent negative safety trends in the nation's trucking fleet,³ focusing on the important role that ADS-equipped CMVs have to play in the future of trucking safety should guide the administration as it considers what constitutes a "regulatory barrier" to the development, adoption, and deployment of ADS-equipped CMVs.

A. "Restricted CDLs" in ADS-equipped CMVs

Licensing is at the core of the regime that FMCSA oversees to ensure that trucking is conducted safely on U.S. roads. To that end, grappling with the application of the CDL system to ADS technologies is necessary.

We believe that between SAE Levels 0-3, in which ADS systems operate in a manner that assists drivers in their efforts to reduce the likelihood of dangerous incidents, FMCSA's contention that human drivers should continue to hold a CDL when operating ADS-equipped CMV is correct. However, we hasten to add that we believe that licensing requirements should be meaningfully modified as safety assumptions evolve, as may be the case with advanced Level 3 technologies.

ADS-equipped CMVs at Levels 4 and 5, operating within their operational design domain ("ODD"), are another matter entirely. With Level 4 and 5 technologies, CDL qualifications and driver fitness requirements are less central to the safe operation of CMVs because these systems shift the driving responsibility and risk of human error from the driver to the on-board system. As a result, a number of FMCSRs - described below - are inapplicable and unnecessary to the operation of such systems. Each circumstance is investigated in detail below:

³ Dept. of Transp., DOT HS 812 603, 2017 Fatal Motor Vehicle Crashes: Overview, 3 (Oct. 2018), <https://bit.ly/2P6GhNn>; U.S. Dept. of Transp., Preparing for the Future of Transportation: Automated Vehicles 3.0, at 6 (Oct. 2018), <https://bit.ly/2P6GhNn>.

1. SAE Levels 0-3

Since ADS-equipped CMVs at Levels 0-3 primarily serve to assist drivers in their efforts to reduce incidents, a human operator must still be ready to intervene when the CMV is operating beyond its operational design domain (“ODD”) and where emergency situations arise. Emergency situations could include approaching emergency vehicles that a truck must yield to,⁴ icy roads during a snowstorm that could frustrate the ADS system, and otherwise unforeseeable road hazards that require judgment calls in the form of human input.⁵ In these situations, we agree that operators should still be subject to some form of CDL requirements laid out in Section 383 of the FMCSRs.⁶

That said, Level 3 vehicles present meaningfully different risk profiles by virtue of the sophistication of their ADS technologies. With this in mind, the introduction of “restricted CDLs” specific to the operation of Level 3 vehicles would better reflect the dynamic between the skill required of drivers and the ADS-enabled vehicle’s abilities. Such a step would be in line with regulatory precedent since, today, under certain circumstances, there are “restricted” CDLs in Section 383.3 based on the availability of labor,⁷ the need for specific knowledge,⁸ and the nature of the enterprise.⁹

We recommend that Level 3-equipped CMVs be: (1) eligible for “restricted CDLs”; and (2) in the context of those restricted CDLs, exempted from the following knowledge and skills testing requirements:

- **Knowledge Requirements (§ 383.111):** Shifting,¹⁰ Speed Management,¹¹ and Space Management.¹²
- **Skills Requirements (§ 383.113):** Basic Vehicle Control Skills such as Shifting Abilities,¹³ and Safe On-road Abilities such as Speed Adjustment,¹⁴ Lane Adjustment,¹⁵ and Following Distance.¹⁶

Each of these knowledge and skills requirements are capabilities programmed into the Level 3 ADS-equipped CMVs,¹⁷ relieving drivers of their need to perform them. A functional equivalent in the

⁴ FMCSA ANPRM at 34.

⁵ Department of Transportation, *Vehicle Automation and Weather: Challenges and Opportunities*, FHWA-JPO-17-494 (Dec. 2016), pdf available at https://rosap.ntl.bts.gov/view/dot/32494/dot_32494_DS1.pdf?

⁶ 49 C.F.R. §383.

⁷ §383 (e).

⁸ §383 (e)(1), (f)(1), (g)(1).

⁹ §383.3(c), (d), (f), (g), (i).

¹⁰ §383.111(a)(5).

¹¹ §383.111(a)(9).

¹² §383.111(a)10.

¹³ §383.113(b)(6).

¹⁴ §§383.113(c)(3) & (7).

¹⁵ §383.113(c)(4).

¹⁶ §§383.113(c)(6) & (8).

¹⁷ See Elizabeth C. Turnbull, *Comment, Hours of Service of Drivers: Harnessing Autonomous Technology for Safer Operations*, 58 *Jurimetrics J.* 105, 114 (2017) (“Partial Automation: The driver’s eyes are fully engaged, but multiple functions are automated, which renders his hands and feet unnecessary. Such functions include

personal automobile context is the advent of automatic shifting. There is no longer a requirement to learn, or be able to use, standard transmission shifting mechanisms because the vehicle is capable of changing gears automatically. In Level 3 ADS-equipped CMVs, shifting is similarly conducted by the on-board ADS; requiring drivers with a restricted CDL who drive ADS-equipped CMVs to understand and demonstrate ability to shift manually would be obsolete. Speed management, beyond applicable local speed limits, and following distance are also capabilities of Level 3 ADS-equipped CMVs that should not be required of drivers operating under a restricted CDL.

2. SAE Levels 4-5

The utility and safety benefits associated with the presence of an operator holding a CDL do not translate directly to Levels 4 and 5 ADS-equipped CMVs, where automated systems can perform many of the intricate tasks of operation. In fact, contemporary evidence shows that Levels 4 and 5 ADS-equipped CMVs reduce the effort and skill required to operate these vehicles, thereby making such vehicles safer because they reduce the possibility of human error.¹⁸

In light of FMCSA's enabling statute, which dictates that minimum safety standards imposed on operators of CMVs should not impair their ability to operate CMVs safely,¹⁹ in this case, CDL requirements, FMCSA should consider modifying Section 383 to accommodate instances in which such technologies are in operation.

To that end, we recommend that (1) the requirement for a CDL be removed entirely in the case of Level 5 technology; and (2) Section 383 be updated to include a Level 4-specific restricted CDL that excludes the following knowledge and skills requirements:

- **Knowledge requirements (§ 383.111):** Shifting,²⁰ Backing,²¹ Signaling Intent Communication,²² Speed Management,²³ Space Management,²⁴ Night Operation,²⁵ Extreme Driving Conditions,²⁶ Skid Control Recovery,²⁷ and Fatigue and Awareness.²⁸

traffic jam assistance, highway assist, predictive powertrain control, lane change assist including right-turning and intelligent parking systems[.]”).

¹⁸ Statement of the American Insurance Association, *The Impact of Autonomous Vehicles on the Future of Insurance*, p. 3 (May 23, 2018), available at <https://www.regulations.gov/document?D=DOT-OST-2018-0149-0072>.

¹⁹ 49 U.S.C. §§ 31136(2) & 31136(3) (West 2019).

²⁰ 49 C.F.R. §383.111(a)(5).

²¹ §383.111(a)(6).

²² §383.111(a)(8)(i).

²³ §383.111(a)(9).

²⁴ §383.111(a)10).

²⁵ §383.111(a)11).

²⁶ §383.111(a)12).

²⁷ §383.111(a)15).

²⁸ §383.111(a)(20).

- **Skills requirements (§ 383.113):** All Basic Vehicle Control Skills,²⁹ and All Safe On-road Abilities.³⁰

B. Hours of Service Regulations in ADS-Equipped CMVs

Driver fatigue is a leading cause of trucking accidents. In response to this demonstrated danger, FMCSRs exist that establish limits on the number of hours drivers may operate their vehicles.³¹ But, it is not clear that the rules that exist today will continue to strike the right balance between safety and the capabilities of future ADS technologies.

1. SAE Levels 0-3

In the context of traditionally operated, or Level 0-3 ADS-equipped CMVs, HOS restrictions are generally sensible. Common underlying factors of motor carrier-related accidents such as driver fatigue,³² distracted driving,³³ and driver error³⁴ revolve around the vigilance and ability of a human operator. These levels of automation still require a human, CDL certified operator to intervene on occasion, and thus operators should still be required to abide by current FMCSRs HOS regulations (§ 395 et. seq.), distracted driving restrictions (§392.8 & 392.82), medical and physical qualifications (§ 391.4 et. seq.), and controlled substance and alcohol use restrictions (§ 382 et. seq.).

However, HOS standards should be relaxed to the extent that a driver is able to relinquish control of a vehicle and shift the driving responsibility to the onboard ADS system for significant stretches of a trip - as will be the case with certain Level 3 technologies. By shifting the driving responsibility traditionally handled by a human driver to a computer-based system, a driver's duties are relieved significantly compared to his or her peers who fall squarely under applicable HOS regulations. This modified duty allows the driver to relax and, for the purposes of HOS fatigue-based regulations, recharge in a manner similar to a second crew member that is along for the ride.

2. SAE Levels 4-5

In the context of ADS-equipped CMVs at Levels 4 and 5, however, these human-focused regulations must be reevaluated to account for the beneficial innovations of ADS technology. By virtue of the technology's intrinsic capabilities, Levels 4 and 5 ADS-equipped CMVs improve safety by shifting the

²⁹ §383.113(b).

³⁰ §383.113(c).

³¹ Hours of Service for Commercial Motor Vehicle Drivers, 49 C.F.R. § 395 (2019), *available at* <https://www.govinfo.gov/content/pkg/CFR-2010-title49-vol5/pdf/CFR-2010-title49-vol5-part395.pdf>.

³² FMCSA NPRM Near Section 6

³³ FMCSA NPRM Near Section 8

³⁴ Volpe, *Review of the Federal Motor Carrier Safety Regulations for Automated Commercial Vehicles*, DOT (Mar. 2018), *available at*

https://web.archive.org/web/20180502183239/http://www.landlinemag.com/DailyNews/ImageUpload/2018/Review_of_the_Federal_Motor_Carrier_Safety_Regulations_for_Automated_Commercial_Vehicles_Preliminary_Assessment_of_Interpretation_and_Enforcement_Challenges,_Questions_and_Gaps_.pdf.

driving responsibility away from the human operator to the ADS system on-board.³⁵ The safety rationale behind HOS regulations is irrelevant in this context because ADS systems serving as the “driver” are not susceptible to distraction, medical emergency, or psychological fatigue.

Where a human is present in a Level 5 ADS-equipped CMV while the CMV is in operation, we agree with FMCSA that such a person should be considered off-duty - similar to a two-driver crew - for purposes of HOS requirements.³⁶

C. Medical and Physical Qualifications Requirements in Level 4 and 5 ADS-equipped CMVs

Relaxing the current FMCSRs related to medical and physical qualifications could be achieved by expanding upon the existing exemptions framework. Acknowledging that ADS systems are supplemental to the driving function, potential CDL candidates who would otherwise be disqualified for medical impairments such as diabetes,³⁷ heart disease,³⁸ respiratory disease,³⁹ and arthritis,⁴⁰ are far more likely to show that an exemption based on their use of an ADS-equipped CMV will “maintain a level of safety equivalent to, or greater than, the level achieved without the exemption.”⁴¹

Drivers with amputated limbs,⁴² or some other impairment that affects their ability to perform normal tasks using their limbs or extremities,⁴³ can be granted an exemption from physical qualifications by demonstrating sufficient skill in the performance of operating a CMV.⁴⁴ Similarly, individuals with diabetes who require insulin treatment may be granted a skill performance evaluation certificate to exempt them from disqualification.⁴⁵

By supplementing the driver’s responsibilities with an ADS system on-board, many more of the medical and physical qualification requirements could be deemed unnecessary. For instance, a person with arthritis could demonstrate the required level of skill to operate Level 4 and 5 ADS-DVs because many of the functions that require driver input, such as shifting gears, steering, braking, and throttling shifted to the ADS system for input. The driver’s responsibility then is to monitor the system, and input route guidance.

D. Distracted Driving

³⁵ For example, a Level 4 ADS-equipped CMV operating within its ODD does not require a human operator at all. In Level 5 CMVs, the ADS technology will be able to perform all of the tasks of a human operator.

³⁶ FMCSA ANPRM Pg 24.

³⁷ §391.41(b)(3).

³⁸ §391.41(b)(4).

³⁹ §391.41(b)(5).

⁴⁰ §391.41(b)(7).

⁴¹ §381.305(a)

⁴² §391.41(b)(1).

⁴³ §391.41(b)(2).

⁴⁴ §391.49.

⁴⁵ §391.46 (a)(1).

We also urge FMCSA to go further still and reevaluate what constitutes “distracted driving” as changes to monitoring and input needs, parallel to the circumstances discussed above, occur. In particular, we believe it is appropriate to reevaluate FMCSRs prohibiting the use of mobile phones (texting and calling)⁴⁶ in Levels 4 and 5 ADS-equipped CMVs. Such systems augment traditional driving capabilities in a manner that makes these regulations inapplicable to FMCSA’s safety-centric focus,⁴⁷ and counter to the goal of imposing minimum regulations to achieve it.⁴⁸

E. Cybersecurity of ADS-Equipped CMVs.

The development and deployment of ADS-equipped CMVs carries with it greater cybersecurity vulnerability than systems reliant primarily on human control. However, while this risk is real, it is also susceptible to mitigation and must be weighed against the reward of realizing the full potential of automation.

Cyber risk begins with connectivity, remote or local. Remote attack vectors stem from device connectivity for conventional purposes, like traffic and systems updates. ADS-equipped vehicles (not just CMVs) are exposed to these cyber risks.⁴⁹ Local attack vectors also exist. With the integration of infotainment systems which rely on USB-connected devices, would-be malefactors may attack ADS-equipped vehicles via a mobile device that is connected via USB cable.⁵⁰

Testing and exploitation of connected cars has led to massive recalls of Chrysler and BMW vehicles after vehicles were hacked in controlled environments.⁵¹ Hackers have also shown an ability to remotely attack a Jeep Cherokee and force it off the road.⁵² Perhaps the most bizarre event occurred when a fourteen-year-old hacked a connected car with \$15 worth of gear.⁵³

These risks are not exclusive to personal automobiles, and as commercial fleets embrace ADS technology, FMCSA should look to these examples as helpful guides for determining risks in a CMV context.

FMCSA is correct to rely on the CyberSecurity Framework put out by the National Institute of Standards and Technology (NIST).⁵⁴ By relying on this framework for securing automobiles from

⁴⁶ §392.80; 392.82.

⁴⁷ 49 U.S.C. §31136(a)(2).

⁴⁸ *Id.*; see also FMCSA ANPRM (“encourag[ing] innovation”).

⁴⁹ See Watney & Draffin at 4. Remote attack vectors refer to the method of penetrating an external communication system used by connected cars from a location removed from the vehicle, or “remote,” via V2V channels like DSRC or V2X channels like 5G.

⁵⁰ *Id.*

⁵¹ *Id.* at 5.

⁵² *Id.* (citing Andy Greenberg, *Hackers Remotely Kill a Jeep on the Highway-With Me In It*, Wired (July 21, 2015), available at <http://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway>).

⁵³ *Id.* (citing Leo King, *14-Year-Old Hacks Connected Cars With Pocket Money*, Forbes (Feb. 23, 2015), <http://www.forbes.com/sites/leoking/2015/02/23/14-year-old-hacks-connected-cars-with-pocket-money>).

⁵⁴ See Nat’l Inst. of Stds. & Tech., Cybersecurity Framework (last visited Aug. 27, 2019), available at <https://www.nist.gov/cyberframework>.

cyber attack, CMVs and personal AVs will both be able to apply foundational principles of security that will reduce the severity, or prevent altogether, cyber attack.

F. Outcome-Based Regulation

Another strategic consideration for future FMCSA rule-making concerns the manner in which it establishes enforcement guideposts. Instead of seeking adherence to any particular prescriptive guidelines, we believe FMCSA should focus on achieving incident reduction by way of an outcomes-based approach. While perhaps counter-intuitive, championing a less particularized approach within FMCSRs will ensure that firms can be innovative, while still being held accountable for their actions.

Respectfully Submitted,

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