May 10, 2018

The Honorable Ray Martinez
Administrator
United States Department of Transportation
Federal Motor Carrier Safety Administration
1200 New Jersey Avenue SE
Washington, DC 20910

RE: Request for Comments on Federal Motor Carrier Safety Regulations which may be Barrier to Safe Testing and Deployment of Automated Driving Systems-Equipped Commercial Motor Vehicles on Public Roads (FMCSA-2018-0037-0001)

Dear Administrator Martinez:

The Commercial Vehicle Training Association (CVTA)[1] is grateful for the opportunity to provide comments to the Federal Motor Carrier Safety Administration as the agency considers highly autonomous commercial vehicles' (HACVs) impact on Federal Motor Carrier Safety Regulations. As an association whose members are tasked with preparing future generations of commercial motor vehicle (CMV) operators for a career behind the wheel, we have been closely monitoring the development of HACV technology. This technology provides great safety benefits to the general motoring public. We anticipate that this technology will change the nature of the work performed by career drivers. Therefore, it will significantly transform the manner in which truck driver training providers educate their students depending on how, and if, future regulations are amended to reflect the implementation of this technology.

CVTA offers its input in response to questions outlined in the request for comments, in addition to a few other matters worthy of the agency's consideration.

HUMAN PRESENCE IN THE CAB IS PARAMOUNT TO SAFETY

In the dialogue over HACV technology it is rare not to hear the argument that automation will replace the need for a truck driver.[2] CVTA believes that while HACV technology will likely be deployed in the future, we do not believe that it will replace human drivers in the foreseeable future. There is no doubt vehicle automation will revolutionize the manner in which all vehicles on the road are operated. However, while it's been demonstrated that trucks can operate without

[1] The Commercial Vehicle Training Association (CVTA) is the largest association representing commercial truck driver training programs in the United States. CVTA members represent 200 training providers in 42 states who collectively train approximately 50,000 commercial drivers annually.
[2] Hook, Leslie. "Out of Road: Driverless Vehicles Are Replacing the Trucker." *Financial Times*. March 30, 2017. https://www.ft.com/content/2d70469c-140a-11e7-b0c1-37e417ee6c76

a driver behind the wheel,[3] there are no guarantees that any level of vehicle automation is flawless.

Passenger and commercial vehicles are becoming more integrated with the Internet of Things (IoT), and the functionality of automated vehicles is absolutely based on this integration. Therefore, like any IoT platform, HACVs may be susceptible to remote hacking or other malfunctions. Such nefarious activity has been demonstrated under a controlled environment where hackers tampered with the acceleration and braking functions of a commercial truck and interfered with its instrument panel.[4] Upon the deployment of HACVs this risk will increase exponentially and it's not the type of problem that can be permanently resolved. It is highly likely that cyber-attacks that are developed to target passenger vehicles will be duplicated or modified to attack commercial vehicles. Cybersecurity is a constant battle to develop and implement updated hardware, firmware and software to stay one step ahead of bad actors who are constantly looking for flaws to exploit, while identifying and eliminating cyber intrusions if they can't first be prevented.

Not only are HACVs and advanced driving systems (ADS) technology in general susceptible to remote hacking, like any kind of computer software it is subject to "crashes" and other types of performance glitches or malfunctions that can affect the vehicle while it is in motion. Simply stated, it's not perfect nor is it expected to be. The only effective safeguard against these flaws is requiring the presence of human supervision by an operator in the cab and ensuring commercial motor vehicle equipment is designed to allow that operator to override all electronic systems and assume control of the vehicle in the event of malfunction or hacking event. Any policy developed by FMCSA or Congress must underscore the necessity of having an operator present in the vehicle at all times.

HACV SYSTEMS PROVIDE OPPORTUNITY FOR 18-20-YEAR-OLD INTERSTATE DRIVERS

Many features that are used in HACVs are currently deployed in the country's largest fleets. Advanced collision warning systems, automatic braking, adaptive cruise control, and lane departure warning systems, combined with electronic logging devices, stability control, automatic transmissions, camera monitoring, and speed limiters make trucks safer than ever to operate. Furthermore, the advancements in technology create the potential to make truck driving an attractive career choice for younger generations, who tend to be more tech-savvy than their older counterparts. Vocational careers are becoming increasingly lucrative choices for post-secondary age groups who either may not be able to afford college, or otherwise see a vocational or technical career as a better option.

Unfortunately, 18-20-year-olds do not have interstate truck driving as a career option. This is particularly disconcerting considering these young adults are at a point in their lives when they are making important long-term life decisions and may miss out on a fulfilling career because

[3] Davies, Alex. "Uber's Self-Driving Truck Makes Its First Delivery: 50,000 Beers." *Wired*, October 25, 2016. https://www.wired.com/2016/10/ubers-self-driving-truck-makes-first-delivery-50000-beers/
[4] Greenberg, Andy. "Hackers Hijack A Big Rig Truck's Accelerator and Brakes." *Wired.* August 2, 2016. https://www.wired.com/2016/08/researchers-hack-big-rig-truck-hijack-accelerator-brakes/

that option is not readily available. Freight carriers are faced with a critical shortage of drivers due to, among other things, retirements,[5] and truck safety technology provides an opportunity for FMCSA (or Congress) to reconsider the minimum driving age to operate a CMV in interstate commerce. We hope the agency will take advantage of this opportunity to do so.

INSPECTION, REPAIR, MAINTENANCE

How should motor carriers ensure the proper functioning of ADS prior to operating in an automated mode? A driver must conduct a pre-trip inspection of his or her vehicle prior to beginning the day operating a CMV. The "pre-trip" includes ensuring that brakes and external lighting are functional; tire tread depth and air pressure are at safe levels; belts, hoses, and brake lines do not exhibit any wear and tear that render the vehicle unsafe to operate; and other observational and technical items to ensure the truck is mechanically safe to operate. FMCSA may want to consider requiring a HACV electronic diagnostic test that a CMV operator can use as part of a pre-trip inspection to effectively ensure that the automated systems controlling acceleration, deceleration, braking, steering and other critical features of the truck are functional.

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.)? It depends on the type of maintenance being performed. If a technician is simply changing a tire or performing mechanical work that is independent of the automated system, we see no reason why a person should be prevented from performing these tasks because the vehicle is highly automated. However, should these tasks have a potential impact on the HACV system, it may be prudent for the technician to either be trained on HACV systems or be accompanied by someone who has that training to ensure the HACV system is not compromised as a result of the maintenance being performed.

What Information Technology (IT) security/safety assurances can be provided by maintenance personnel and CMV drivers/operators that the ADS systems are functioning properly? HACV systems should be frequently monitored and inspected to ensure they are free of viruses, malware, or other "bugs" that could have a potential negative safety impact. Software should be regularly updated. Much as an office would have an IT team to manage information systems and ensure their integrity, carriers that deploy HACVs should likewise employ a team whose job it is to ensure the safety and performance of the automated systems in the trucks that use them.

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? Any truck with a HACV system malfunction that has a negative impact on the vehicle's ability to accelerate, decelerate, brake, steer, or otherwise safely contain a load should be immediately put out-of-service. The only exception would be if there is a way to completely disengage the HACV system or override it so that the driver can assume full control of the vehicle without any residual interference from the HACV system, assuming the truck is otherwise mechanically sound.

[5] Costello, Bob. *Truck Driver Shortage Analysis 2017*. American Trucking Associations. October 2017. http://progressive1.acs.playstream.com/truckline/progressive/ATAs%20Driver%20Shortage%20Report%202017.pdf

Furthermore, it's important to note that motor carrier enforcement officers will likely either need to be trained to identify problems with HACV systems or have diagnostic tools at their disposal to ensure the safety of a HACV.

ROADSIDE AND ANNUAL INSPECTIONS

How could an enforcement official identify CMVs capable of various levels of automated operation? For a motor carrier enforcement officer to readily identify a HACV, it may be worth considering requiring an operator to have documentation denoting the vehicle's level of automation to accompany the driver's commercial driver's license (CDL), record of duty status (RODS), bill of lading, and other documents that are generally provided to a law enforcement officer during a traffic stop or roadside inspection.

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? We would defer to motor carriers on whether or not they deem it necessary to visibly mark their vehicles to identify them as highly automated. However, we imagine that experienced truck drivers would attest with a high degree of confidence that regardless of how the truck is marked, it will make no difference to the negligent driver of any commercial or passenger vehicle that interacts unfavorably with other CMVs.

DISTRACTED DRIVING

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?

There should be no changes to distracted driving regulations. Operators of any vehicle must maintain situational awareness at all times because there will be moments when automated systems fail to brake or maneuver to avoid an accident. We witnessed this earlier in the year in Arizona when a SAE Level 4 Volvo SUV operated by Uber failed to identify a pedestrian crossing the road, thereby striking and killing her.[6] A camera in the vehicle's interior showed the driver of the vehicle was repeatedly looking down in a manner consistent with someone looking at a handheld device.[7] It is difficult to determine with any certainty whether this accident could have been avoided had the driver appeared to be more engaged in the vehicle's operation and its surroundings. While there is little doubt the technology continues to improve, this does not negate the necessity for operators of any vehicle at any level of automation to be situationally aware and ready to assume control of their vehicle in a moment's notice.

[6] National Transportation Safety Board. March 18, 2018. https://www.ntsb.gov/investigations/Pages/HWY18FH010.aspx
[7] ABC 15 Arizona. "Police release video of deadly Uber crash in Arizona." March 21, 2018. https://www.youtube.com/watch?v=QRgdasOwjVM&ab_channel=ABC15Arizona (VIEWER DISCRETION IS ADVISED).

MEDICAL QUALIFICATIONS

What medical conditions currently precluding issuance of a medical card could become inapplicable as ADS technology develops? None. As long as an operator is in the vehicle ready to assume control in the event of a malfunction, they should continue to meet the current medical standards set forth by FMCSA in order to obtain and renew a CDL. CMV operators must be in sound physical and cognitive condition in order to operate a vehicle safely. Modern-day commercial aircraft systems are highly automated and yet pilots are still required to meet baseline medical standards; it should be no different for operators of HACVs.

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 above. Medical qualifications for the operation of a CMV should not be amended or otherwise fluctuate based on a vehicle's level of automation.

HOURS OF SERVICE

At this time CVTA sees no reason to amend hours of service regulations for CMV operators of HACVs. A system's level of automation does not reduce a driver's responsibility to maintain a level of situational awareness that can only be obtained with sufficient rest, nor does it mean he or she should be allowed to exceed the maximum number of on-duty hours permitted under federal hours of service regulations.

CDL ENDORSEMENTS

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? CVTA believes a HACV endorsement may be necessary considering the complexity of these systems. A CDL applicant testing for a HACV endorsement should know how and when to engage and disengage the system, be familiar with the limitations of certain automated systems, and especially demonstrate the ability to usurp control of the vehicle from the automated system in order avert or mitigate a collision. FMCSA needs to work with technology companies, motor vehicle administrators and truck driver training providers to determine how to amend curriculum requirements in the entry-level driver training rule so that it can include CDL training criteria for HACVs. Furthermore, successfully running a diagnostic check on the automated system of a HACV may need to be included in the pre-trip portion of a CDL skills test.

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? Certainly, any SAE Level 5 system should be able to maneuver the vehicle as if a well-trained professional driver is behind the wheel. However, CVTA does not believe any vehicle, be it passenger or commercial, should ever be deployed without an operator inside to assume control in a moment's notice.

CONCLUSION

Again, CVTA appreciates the opportunity to share our input on this request for comment. We welcome the advent of new technologies that improve highway safety. Regardless of technological abilities, any component of highway safety is not complete without highway users that are cognitively and physically engaged with their vehicles, and situationally aware of their surroundings. While technology can compensate for human error, humans can also compensate for technological error and this balance must be recognized in any regulatory framework.

Please look to us as a resource on the issue of commercial vehicle automation and how it relates to the education and training of professional truck drivers.

Thank you for your consideration.

Sincerely,

Don Lefeve
President & Chief Executive Officer
Commercial Vehicle Training Association