



BEFORE THE
U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

DOCKET NO. PHMSA-2018-0001

REQUEST FOR INFORMATION ON REGULATORY CHALLENGES TO SAFELY TRANSPORTING HAZARDOUS
MATERIALS BY SURFACE MODES IN AN AUTOMATED VEHICLE ENVIRONMENT

COMMENTS OF
NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC.

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I. INTRODUCTION

The National Motor Freight Traffic Association, Inc. (NMFTA) submits these comments in response to the March 29, 2018 request for information, published by the Pipeline and Hazardous Materials Safety Administration (PHMSA or Agency) at 83 Fed. Reg. 13464 (Request). That request seeks input on the potential future incompatibilities between the hazardous materials transportation requirements in the Hazardous Materials Regulations (HMR) and a surface transportation system that incorporates automated vehicles. NMFTA welcomes the Agency's proactive efforts to support a regulatory environment which encourages the safe testing and deployment of technologies with great potential to improve the efficiency and safety of our nation's roadways.

II. STATEMENT OF INTEREST

NMFTA is a nonprofit membership organization headquartered at 1001 North Fairfax Street, Suite 600, Alexandria, VA 22314. Its membership is comprised of more than 500 motor carriers operating in interstate, intrastate, and foreign commerce primarily specializing in the transportation of less-than-truckload (LTL) quantities of freight. Approximately 71% of those carriers are registered with PHMSA to transport certain types and quantities of hazardous materials. NMFTA represents the interests and welfare of its members in judicial, regulatory, and legislative proceedings that involve matters affecting their operations.

While the potential safety benefits from Automated Driving Systems (ADS) technology installed in Commercial Motor Vehicles (CMVs), including CMVs transporting hazardous materials, is immense, Americans currently express reservations about autonomous vehicle technology, with 54% of survey respondents stating that they would feel less safe sharing the road with a self-driving vehicle¹. Further, respondents to a survey of NMFTA's membership indicated concerns regarding the potential to compromise ADS in motor vehicles that contain hazardous materials. Accordingly, NMFTA sets forth below its comments in an attempt to contribute to the safe testing and deployment of CMVs with ADS transporting hazardous materials in a manner that is agreeable to NMFTA's membership and the general driving public, while being consistent with the realities of motor carrier operations.

¹ <https://newsroom.aaa.com/tag/in-vehicle-technology/>

III. COMMENTS

The Agency requested comments on a number of specific questions on the safety, regulatory, and policy implications of the design, testing, and integration of surface automated vehicles and the HMR. For the Agency's consideration, NMFTA offers the following responses to some of the Agency's questions posed in the Request. NMFTA expects to provide more substantive comments following the publication of any Notice(s) of Proposed Rulemaking.

WHAT ARE THE SAFETY, REGULATORY, AND POLICY IMPLICATIONS OF THE DESIGN, TESTING, AND INTEGRATION OF SURFACE AUTOMATED VEHICLES ON THE REQUIREMENTS IN THE HMR?

Although there is great potential for ADS technologies to improve road safety, those safety benefits remain largely theoretical. Significant technological hurdles must be overcome, and substantial research and testing remain to be completed and analyzed before the safety benefits of such technologies move beyond being theoretical. NMFTA supports testing of CMVs with ADS that include trailers full of freight to replicate real world operations. Not only should this testing be conducted in a safe environment and under extremely controlled circumstances, but at no point should this testing be done with trailers carrying any freight regulated as hazardous.

NMFTA supports research to develop, improve, and make more affordable automated technologies that have been proven to reduce incidents and accidents. These technologies include anti-lock brake systems, advanced emergency brake systems, electronic stability control and road departure warning systems, lane changing assistance, collision avoidance radar and cameras and, only in instances where the driver becomes incapacitated, functions that take over the operation from the driver. NMFTA does not support the use of autonomous CMVs—especially autonomous CMVs transporting hazardous materials—until a proven safety record for such technology is established. It is evident from the recent accidents² involving autonomous cars that technology has yet to reach an acceptable level of safety for a small passenger vehicle, much less for an autonomous tractor trailer, weighing 80,000 pounds, traveling at 65 miles per hour, transporting hazardous materials.

When designing, testing, and integrating surface automated vehicles, cybersecurity risks are a primary concern. NMFTA's members collectively operate close to 200,000 power units comprising diverse vehicle fleets of CMVs. CMV fleets tend to be standardized and are typically more connected

² <https://www.nytimes.com/2018/03/19/technology/uber-driverless-fatality.html>

than passenger automobiles. CMVs are designed and built with both original equipment manufacturer (OEM) factory-equipped technology, as well as aftermarket devices with internet connectivity. Parts such as brakes, transmissions, and engines are often purchased from third parties, which increases supply chain vulnerabilities. The potential for remote and physical compromise of automated technologies in a CMV or a fleet of CMVs, and the use of the hazardous materials for nefarious purposes once the CMV or fleet is compromised, is a real national security concern.

Moreover, federal preemption of regulations concerning CMVs with ADS technology transporting hazardous materials would be necessary. If states and municipalities had different or more rigorous requirements for automated vehicles than those promulgated by the federal government, the use of the technology would be limited to the most stringent requirements. It would benefit owners and operators of CMVs equipped with ADS technology for the Agency to not permit alternative state or local requirements in the transporting of hazardous materials.

In addition to being trained in understanding the coload and segregation requirements of hazardous materials, the CMV driver must also understand the ADS technology, including its abilities and limitations. Transporting hazardous materials subjects a higher liability on the driver and carrier, which necessitates testing and approval for commercial driver's license (CDL) endorsements.

WHAT ARE POTENTIAL REGULATORY INCOMPATIBILITIES BETWEEN THE HMR AND A FUTURE SURFACE TRANSPORTATION SYSTEM THAT INCORPORATES AUTOMATED VEHICLES?

Starting with 49 CFR § 171.1, "Applicability of Hazardous Materials Regulations (HMR) to persons and functions," the HMR presume that a sentient being, who is able to be present inside and outside of the motor vehicle, and capable of identifying and resolving issues, is involved in the transportation of hazardous materials. This mindset is woven into the fabric of the HMR. This is evident in the definitions and references to "person," "hazardous materials employee," and "individual." It is latent in the terms "knowingly" (49 CFR § 107.307) and "unforeseen" (49 CFR § 177.840(h)) and explicit in the "vehicle attendance" requirements (49 CFR § 177.835) and the requirement that the carrier either replace ID numbers or hand write them during transportation (49 CFR § 172.338). To integrate automated technology into the HMR, PHMSA would have to deconstruct the current regulatory system—which often assumes human actions and intervention—and construct in its place, regulations centered on performance, goal-oriented requirements of materials, packaging, machinery and systems.

a. Emergency response information and hazard communication

49 CFR § 177.817(e) requires that the driver makes the shipping paper accessible during an accident or inspection. Depending on the SAE automation level of the vehicle, owners and operators of CMVs with ADS technology would be required to remotely monitor the location of a vehicle transporting hazardous materials in the event of an accident. The shipping papers would have to be provided electronically to emergency responders. If an accident were to occur, the carrier personnel monitoring the vehicle, would have to contact emergency response personnel and immediately assess the situation to determine the degree of damage and danger, and whether or not the packaging is damaged and the product no longer contained. However, these actions would be handled by the driver when the vehicle is equipped with lower SAE automation levels.

b. Packaging and handling requirements, including pre- transportation functions

49 CFR § 177.816(a) requires that no carrier may transport, or cause to be transported, a hazardous material unless each hazmat employee who will operate a motor vehicle has been trained in the applicable requirements of 49 CFR parts 390 through 397, and the procedures necessary for the safe operation of that motor vehicle. Driver training must include the following subjects: (1) Pre-trip safety inspection; (2) Use of vehicle controls and equipment, including operation of emergency equipment; (3) Operation of vehicle, including turning, backing, braking, parking, handling, and vehicle characteristics including those that affect vehicle stability, such as effects of braking and curves, effects of speed on vehicle control, dangers associated with maneuvering through curves, dangers associated with weather or road conditions that a driver may experience (e.g., blizzards, mountainous terrain, high winds), and high center of gravity; (4) Procedures for maneuvering tunnels, bridges, and railroad crossings; (5) Requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting; and (6) Loading and unloading of materials, including (i) Compatibility and segregation of cargo in a mixed load; (ii) Package handling methods; and (iii) Load securement.

The HMR would have to maintain the requirements for pre-trip safety inspection, requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting, loading and unloading of materials, including compatibility and segregation of cargo in a mixed load, package handling methods, and load securement. Carrier personnel would still need to be present during loading and unloading of any hazardous material to ensure the material is properly packaged and labeled for transport; ensure there are no prohibited materials included, if applicable; ensure that the vehicle is

appropriately placarded, when necessary; and ensure that there are no co-loading or segregation issues with other freight on the vehicle.

49 CFR § 177.817(a) states that a person may not accept a hazardous material for transportation or transport a hazardous material by highway unless that person has received a shipping paper prepared in accordance with 49 CFR part 172 or the material is excepted from shipping paper requirements. A subsequent carrier may not transport a hazardous material unless it is accompanied by a shipping paper prepared in accordance with 49 CFR part 172, except for 49 CFR § 172.204, which is not required. 49 CFR § 177.817(b) states that an initial carrier may not accept a hazardous material offered for transportation unless the shipping paper describing the material includes a shipper's certification which meets the requirements in 49 CFR § 172.204. The driver is the natural hazardous materials employee to accept a hazardous material in transportation, as the driver is the only carrier employee present at the pickup location of the shipment. Many of the tasks that the driver currently does today will not be able to be automated or done remotely.

c. Incident response and reporting

Any person in possession of a hazardous material during transportation, including loading, unloading, and storage incidental to transportation, must report to the Department of Transportation (DOT) if certain conditions are met. This means that when the conditions apply for completing the report, the entity having physical control of the shipment is responsible for filling out and filing DOT Form F 5800.1. 49 CFR § 171.15 of the HMR requires an immediate telephonic report (within 12 hours) of certain types of hazardous materials incidents.

d. Safety and security plans (e.g., en route security) (e) Modal requirements (e.g., highway and rail)

49 CFR § 172.802(a) requires carriers who transport certain quantities or types of hazardous materials to develop a security plan that assesses transportation security risks for shipments of the hazardous materials listed in 49 CFR § 172.800, including site-specific or location-specific risks associated with facilities at which the hazardous materials listed in 49 CFR § 172.800 are prepared for transportation, stored, or unloaded incidental to movement, and appropriate measures to address the assessed risks. Specific measures put into place by the plan may vary commensurate with the level of threat at a particular time. When developing regulations pertaining to automated vehicle technology and security plans, PHMSA must consider the risk of compromise to CMVs with ADS technology. Contained in the security plan could be a requirement that CMVs transporting hazardous materials listed

in 49 CFR § 172.800 would have to meet a higher level of security than that authorized for other hazardous materials to protect CMVs from compromise.

WHAT AUTOMATED SURFACE TRANSPORTATION TECHNOLOGIES ARE UNDER DEVELOPMENT THAT ARE EXPECTED TO BE RELEVANT TO THE SAFE TRANSPORT OF HAZARDOUS MATERIALS, AND HOW MIGHT THEY BE USED IN A SURFACE TRANSPORTATION SYSTEM?

Studies on Connected Vehicles, Intelligent Highways, and Intelligent Transportation Systems with Technology Transforming Transportation to achieve zero fatalities and zero delays are ongoing. Examples of Vehicle to Vehicle communication systems include Forward Collision Warning, Lane Change Warning, and Curve Speed Warning. These are extensions of existing features already in the automobile market such as automatic emergency braking and adaptive cruise control. The vehicles receiving these messages could take corrective action by alerting the driver, engaging brakes, making steering corrections, and other actions to avoid an accident. This type of technology is required for heavy vehicle platooning in which a lead vehicle could control one more additional vehicles in a caravan type formation.

Vehicle to Infrastructure communication systems include concepts such as red light warning, curve speed warnings, Railroad Crossing Violation Warning, Spot Weather Impact Warning, Oversize Vehicle Warning, Reduce Speed/Work Zone Warning, and Signal Phase and Timing priority movement for emergency vehicles. In these scenarios the vehicles interact with their environment such as bridges, tunnels, stop lights, construction zones, etc. using short range communication messages. In some instances the exchange would be limited to information messages for drivers but in others advanced computer controlled proactive actions are contemplated to adjust speed, direction of travel, etc. These technologies could, in theory, reduce incidents and accidents in hazardous materials transportation.

WHAT ISSUES DO AUTOMATED TECHNOLOGIES RAISE IN HAZARDOUS MATERIALS SURFACE TRANSPORTATION THAT ARE NOT PRESENT FOR HUMAN DRIVERS OR OPERATORS THAT PHMSA SHOULD ADDRESS?

When designing and testing automated technologies, a primary concern should be to ensure that hazardous materials in transportation cannot be weaponized. As stated in PHMSA's Enhanced Security Requirements brochure, "in the wrong hands, ...hazmat can pose a significant security threat, particularly those that can be used as weapons of mass destruction. Addressing this security threat is vital to the safety of our citizens and security of our economy ." PHMSA should work with its federal

partners and other stakeholders, including NMFTA , to ensure that in designing, testing, and integrating automated technologies, the potential for compromise is eliminated or at least minimized.

Ethics will have to be built in to any automated system. Programmed into the technology would have to be choices that may or not be made by a human in the same circumstances. Split second decision making in an emergency situation where the experience and skills of the driver can circumvent a potential accident might not be considered when programming a computer. How will a computer distinguish between a person in a fur coat from an animal or a stop sign obscured by graffiti or stickers? Will the CMV containing hazardous materials be programmed to go off a cliff or hit an oncoming car where those are the only options? Programming the vehicle to react in these situations would have to include consideration of what hazardous materials are being transported—a flammable liquid would react differently than a TIH or a radioactive material in different situations.

The cybersecurity of CMVs with ADS technology transporting hazardous materials must be considered. Additional information can be provided through NMFTA’s Heavy Vehicle Cyber Security Program³.

IV. CONCLUSION

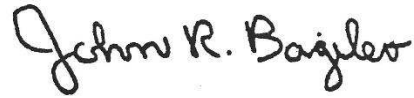
NMFTA supports the Agency’s position that ADS equipped vehicles may lead to significant safety, mobility, and efficiency benefits if properly implemented. Consequently, NMFTA offered perspective from the LTL sector of the trucking industry on some of the questions posed by the Agency. NMFTA acknowledges that although ADS technology is being rapidly developed, to ensure that this technology is safely used on our nation’s roadways will require extensive effort on the Agency’s behalf, and we applaud the Agency’s efforts to update the existing HMRs to stay current with emerging technologies. We look forward to submitting comments on any related Notice of Proposed Rulemaking that may be developed.

³ <http://www.nmfta.org/pages/HVCS>

Respectfully submitted,



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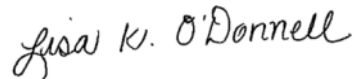


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