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IN THIS ISSUE

Current Federal Motor Carrier Safety Administration regulations are not equipped to address new regulatory challenges that will be presented by advances in driverless technology and automated trucking fleets. Unless there are changes, the regulations will likely stall use of this technology by negating many of the commercial advantages associated with its use.

Ready or Not, Here it Comes: How Current Regulations Must Adapt to the Development of Driverless Trucking Fleets

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The next major revolution in trucking will likely stem from advances in driverless vehicle technology. Since the technology has the potential to extend daily drive times, reduce costs, increase safety and solve the driver shortage problem, it is more a question of when—rather than if—driverless technology will be integrated into modern trucking fleets. However, the current regulatory framework established by the Federal Motor Carrier Safety Administration is not yet equipped to deal with this emerging technology and may stymie its adoption if it is not amended.

Self-driving vehicles are packed with sensors, cameras, computers and other electronic equipment that allow the vehicle to perceive its environment. Radar transmitters encircle the car to detect other nearby cars or other objects, cameras determine what color the upcoming traffic light is and detect road signs, and a spinning dome on the roof contains a Light Detection and Ranging (LIDAR) system which projects lasers that bounce off nearby objects to create a highly-detailed three-dimensional map. This bundle of sensory equipment creates massive amounts of data which is then processed and interpreted by the vehicle's state of the art computing hub. Based on the information relayed by the sensors, the computer determines whether the vehicle needs to stop, slow down, speed up, or turn to avoid hitting other vehicles (or to follow curves in the road).

At this point, "driverless" cars are not truly driverless—they still require oversight from a live person. Nonetheless, high-tech vehicles are already taking to the streets that require a human driver to do next to nothing. Tech companies such as Google and Tesla are in the process of testing these vehicles and Uber, the private taxicab service, has even begun using driverless cars to ferry passengers in Pittsburgh (although a driver is still present just in case).[1] New models of Tesla vehicles also incorporate self-driving features, such as the adjustment of vehicle speed to conform to the surrounding traffic, changing lanes and parking.[2] Tesla even advertises a fully automated version available for purchase.[3] Although a driver using Tesla's Autopilot system was killed in a car accident in May of 2015, the National Highway Traffic Safety Administration recently concluded the Autopilot feature was not defective.[4] Rather, the driver was using the system on a highway that exceeded its design limits.

Most of the focus in this emerging field has been with respect to the implementation of this technology in everyday passenger vehicles. However, the commercial advantages to trucking companies from this emergency technology are apparent—although there are different challenges associated with its use in a 40-ton truck versus a passenger vehicle. Freight companies in China have recognized this potential and are taking advantage of the relative lack of

[1] Michael Laris, *You can ride in a driverless Uber in Pittsburgh starting later this month. You'll have a chaperone though.*, THE WASHINGTON POST (Aug. 18, 2016), https://www.washingtonpost.com/news/dr-gridlock/wp/2016/08/18/you-can-ride-in-a-driverless-uber-in-pittsburgh-youll-have-a-chaperone-though/?utm_term=.78730a9ddc87.

[2] TESLA MOTORS, https://www.tesla.com/autopilot/ (last visited Jan. 30, 2017).

[3] *Id*.

[4] Peter Valdes-Dapena, *Tesla Autopilot not defective in fatal crash*, CNN TECH (Jan. 19, 2017, 1:44 PM), http://money.cnn.com/2017/01/19/technology/tesla-investigation-closed/index.html.

regulation in its country by rolling out driverless trucks.[5] Initial progress is also taking shape in the United States. In Colorado, a truck equipped with technology from a company called Otto recently completed a 120-mile delivery across Interstate 25—all without assistance from a human driver.[6]

While the technology surrounding driverless vehicles is developing rapidly, the law is not. Without significant change to the rules and regulations applicable to trucking fleets, significant legal impediments exist to the growth of this technological development in the commercial trucking field.

Regulatory issue #1: there is no definition of "driver"

Perhaps the most significant roadblock to implementing driverless fleets is that the regulations never define what it means to drive a commercial motor vehicle. As simple as this is, the negative implications for driverless technology are significant—if not prohibitive.

When technology develops to a point when vehicles are truly autonomous and no human oversight is required, it would take an unreasonable stretch of the imagination to say that computers are not "driving" a commercial motor vehicle. After all, every facet of driving would be performed by a computer, including acceleration, braking, turning, navigating, and responding to objects and vehicles in the road. As a driver, the computer systems, therefore, appear to fall squarely under the web of regulations set by the FMCSA.

Some of these requirements are simply quirks that result from applying regulations written for human drivers to virtual drivers, such as requiring drivers to wear seatbelts.[7] The bigger concern, though, is the effect of the driving time regulations as they would apply to self-driving fleets.

The hours of service regulations prohibit a driver of a truck carrying property from being on duty for more than 14 consecutive hours, with only 11 of those hours actually being spent behind the wheel.[8] For the purpose of the driving time regulations, driving time is currently defined as "all time spent at the controls of a commercial motor vehicle in operation" and there is no definition of "driver."[9] Even a self-driving truck therefore falls under these restrictions.

One of the primary reasons sparking carriers to invest in driverless fleets is so that trucks may drive for longer periods of time and thereby increase efficiency without compromising safety. However, the current hours of service regulations would all but negate that benefit by applying the same driving restrictions to both human and virtual drivers. Unlike in the context of human drivers, such restrictions serve little purpose as applied to virtual drivers.

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[5] Will Knight, *China's Driverless Trucks are Revving Their Engines*, MIT TECHNOLOGY REVIEW (Nov. 16, 2016), https://www.technologyreview.com/s/602854/chinas-driverless-trucks-are-revving-their-engines/.

[6] Alex Fitzpatrick, *Watch Uber's Self-Driving Trucks Make a Beer Run*, TIME (Oct. 25, 2016), http://time.com/4544135/uber-otto-self-driving-trucks-budweiser-beer/.

[7] 49 C.F.R. § 392.16(a).

[8] 49 FC.F.R. § 395.3.

[9] See 49 C.F.R. § 395.2.

The solution may be simple: the FMCSA could promulgate new regulations that define what it means to drive a commercial motor vehicle and simply (and explicitly) exclude self-driving commercial vehicles from that definition. It may still be beneficial to require some period of mandatory downtime for self-driving vehicles to allow the new technology to be reset, tested and maintained. As such, the regulatory decision-makers would likely require input from academia, manufacturers and the public to determine the appropriate language.

Regulatory issue #2: the ban on unsafe driving practices

The current regulations prohibit operation of a truck "in such a condition as to likely cause an accident or a breakdown of the vehicle."[10]As an initial matter, does this regulation require a ruling—whether formal or informal—from the FMCSA that use of self-driving technology is, in fact, safe? At least into the foreseeable future, there is always some risk that computers will malfunction or that sensors will fail, although these risks can be significantly reduced through the use of redundant, backup technology. Nonetheless, prudent trucking companies may be hesitant to make the significant investment of upgrading to a driverless fleet until they receive some assurance that their investment will not be declared as "likely to cause an accident." Eventually it is hoped this technology will reach a point where it is even safer than human drivers, though that point may be several years in the future.

The regulatory prohibition on unsafe driving practices will also likely encompass one new highly-anticipated method of trucking that will be made possible through self-driving technology: platooning. Platooning involves multiple trucks traveling at very close distances, often mere yards apart. For the trucks traveling behind the lead truck, the close proximity allows for wind resistance to be reduced and fuel economy increased. Initial research from the U.S. Department of Transportation has indicated fuel savings could be as much as 10 percent.[11]

Tractor-trailers traveling one after another in such close proximity present apparent dangers since the following vehicle's ability to react to a slow-down of the lead vehicle would be minimized. Additionally, there may also be safety concerns for passenger vehicles sharing the highway with truck platoons. This likely makes platooning fall under the prohibition of driving practices likely to cause an accident. Until there is some regulatory accommodation to allow platooning, the current regulations will not allow driverless trucking fleets to be implemented to their fullest extent to yield the greatest benefit and return on investment.

Regulatory issue #3: qualifications to drive a commercial motor vehicle

In order to drive a truck, the driver must be "qualified to drive a commercial motor

[10] 49 C.F.R. § 396.7(a).

[11] David Bevly et al., *Heavy Truck Cooperative Adaptive Cruise Control: Evaluation, Testing, and Stakeholder Engagement for Near Term Deployment: Phase One Final Report* (April 30, 2015), *available at* http://atri-online.org/2015/05/27/4410/.

vehicle."[12] The current qualification standards are ill-suited to accommodate driverless technology as they clearly contemplate human drivers (i.e., drivers must be at least 21 years old,[13] pass a physical and health assessment,[14] and possess a commercial driver's license[15]). The plain language of the standard appears to effectively prohibit computers from driving trucks, as computers cannot comply with these requirements. While this may be overcome by keeping a human driver in the cab at all times to monitor the computer systems, the qualification requirements will prevent truly driverless trucks from taking to the road.

This is not to suggest that all qualification-related regulations ought to be discarded. Rather, they should be changed to reflect the unique issues associated with self-driving vehicles. More than likely the qualification regulations will take the form of minimum technological standards for the driverless technology being utilized, rather than physical qualifications of the driver. For example, a requirement that the vehicle be able to perceive and adapt to road conditions within a half mile radius of the vehicle makes much more sense than a requirement that the driver be 21 years old.

Change is on the horizon

In the fall of 2016, the National Highway Traffic Safety Administration issued regulatory guidance for self-driving cars.[16] The scope of this guidance was broad, as it applied to virtually every vehicle incorporating automation technology, including those operated by transit companies.[17] The guidance also signified that NHTSA would strive to foster technological development by encouraging manufacturers to seek exemptions for regulatory requirements where appropriate.[18] Finally, it hinted that the Department of Transportation would begin stretching its wings to regulate issues surrounding self-driving cars at the federal level.[19] Notably, the regulatory framework proposed in the guidance suggests the burden of demonstrating the safety of self-driving vehicles lies with the manufacturers rather than the U.S. Department of Transportation. Manufacturers are mandated to provide information relating to issues such as their vehicles' cyber security measures, crashworthiness, and ability to detect and respond to objects in the road and consumer education.[20]

Conclusion

One of the most potentially exciting (and likely inevitable) developments in the trucking industry may be approaching closer every day. Driverless vehicles will allow trucking fleets to operate for longer periods of time with less expense, all while increasing safety. However, as with many emerging technologies, the law has not kept up with advances in self-driving

[12] 49 C.F.R. § 391.11(a).
[13] 49 C.F.R. § 391.11(b)(1)
[14] 49 C.F.R. § 391.11(b)(4)
[15] 49 C.F.R. § 391.11(b)(5)
[16] NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, *Federal Automated Vehicles Policy: Accelerating the Next Revolution in Roadway Safety* (Sept. 2016), *available at* https://www.transportation.gov/AV/federal-automated-vehicles-policy-september-2016.
[17] *Id*. at p. 11.
[18] *Id*. at p. 12.
[19] *Id*. at p. 38.
[20] *Id*. at p. 15-16.

trucking fleets and will likely stand in the way of implementing this technology to its fullest extent. In addition to necessitating a whole new area of regulation to address the technological aspect, the existing regulations must also be modified to allow and ensure regulations written for human drivers do not throw a wrench in the development and implementation of driverless technology.

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