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PERSPECTIVE ON AUTONOMOUS TRUCKING

AUTONOMOUS TIME

Autonomous vehicle technology could transform freight efficiency by an exponential factor.

The potential autonomous technology holds for transforming the global trucking and logistics industries is staggering to contemplate. The technology is so new, so yet untested in real-world driving/delivery operations that much of what we think regarding its potential benefits is theoretical in nature.

Currently, testing is being carried out by OEMs and tech developers worldwide. And already the data is showing some very promising results: We know now, for example, that trucks operating in autonomous mode seem to deliver a consistent, and significant fuel economy advantage over similar vehicles with human drivers in control.

By the same token, the data also suggests autonomous trucks will be safer on the highways. Computers don't get tired. They don't get angry, or impatient. And they don't take unnecessary risks unless they've been programmed to do so.

And we're beginning to see data indicating that maintenance demands may be reduced on autonomous trucks since on-board computers tend to have a much better "touch" when it comes to engaging clutches, shifting gears or applying brakes. So, in general, it appears there's simply less wear-and-tear on autonomous drivetrains across the board compared to conventional, human-controlled ones.

But there's another potential benefit of autonomous truck operations that really isn't getting a lot of attention at the moment. And it's one that could transform freight efficiency by an exponential degree: Time.

Currently, there are two major impediments to moving freight as fast as it is theoretically possible to do: Human fatigue and speed limits.

Currently, the Federal Motor Carrier Safety Administration (FMCSA) Hours of Service (HOS) Rules limit truck drivers to about 10 hours of wheel time in a 24-hour period. Now, obviously, there still are plenty of old school drivers out there who have no doubt in their minds that they could easily put in 15 hours at the wheel — if only the government would mind its own business.

And regardless of what you think about the current FMCSA's 10-hour rule, the simple physiological fact is, sooner or later, human beings have to rest. And, the less rest a driver has, the greater an accident risk they become over time.

Tied in closely with this issue are speed limits. How much better would a fleet's freight efficiency be if its drivers were allowed to cruise at 80 mph for 15 hours at a stretch?

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Some basic math provides a few answers:

Let's say, theoretically, that a human driver logs 10 hours behind the wheel on a long-haul Interstate run, doing an average speed of 65 mph — a fairly realistic workday given current FMCSA regulations. In that scenario, he or she would cover about 650 miles while on duty before it was time to pull off the road and shut down for the night.

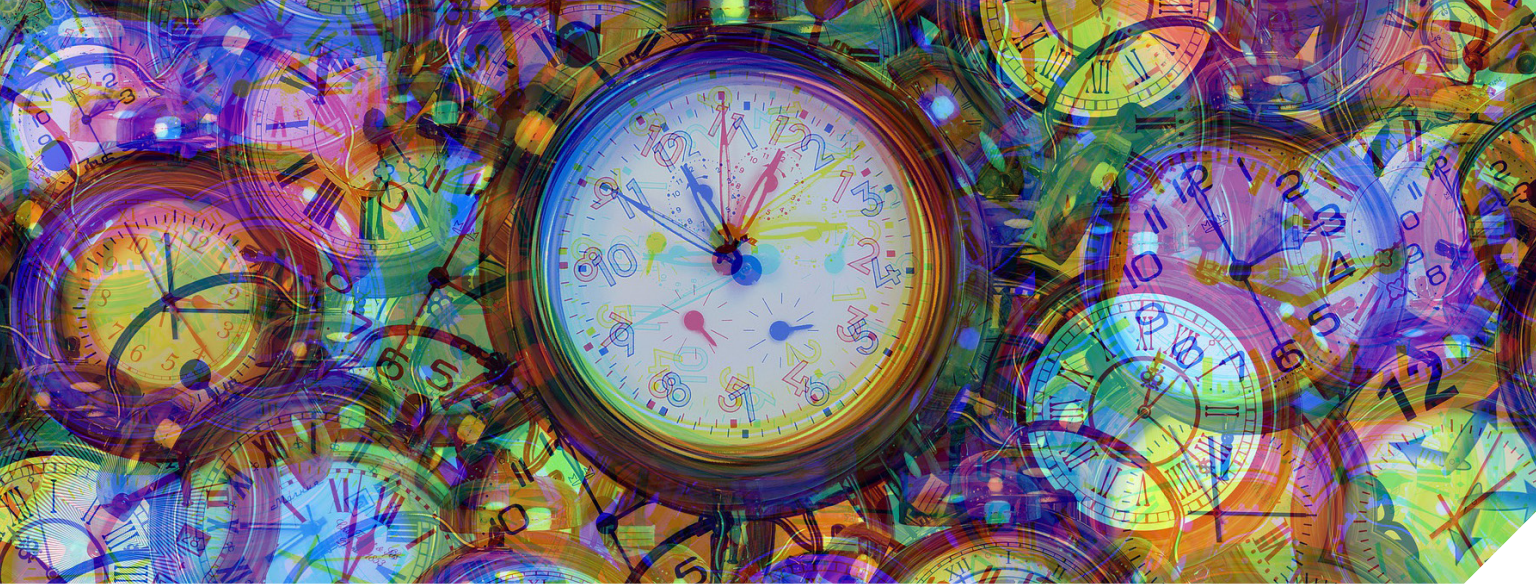

Image by Gerd Altmann from Pixabay

Now, suppose the same driver was allowed to run 15 hours at an average speed of 80 mph before it was time to find a park and get some shuteye. That driver would cover 1,200 miles while on duty — essentially twice the distance the first driver did on their shift.

Now, let's look at what an autonomous truck on the same run would do.

For starters, we can throw the FMCSA Hours of Service rule book out the window. Because we're assuming that this is an SAE Level 5, fully autonomous truck, there aren't any humans onboard at all. Which means that this truck can run pretty much around the clock if it's in good mechanical shape — stopping only for fuel. For the sake of argument, let's factor in two fuel stops at 30 minutes apiece. So, the autonomous truck in this little mental experiment is going to be running for 23 hours — give or take a few minutes — at cruise speed during its workday on this route.

And what will that cruise speed be? Well, obviously the autonomous truck has a vastly larger operating window time-wise than a human driver does. And even if it didn't, speeding is completely out of the question thanks to computer programming limitations. The main two drivers for determining autonomous truck speed in this scenario will likely be safety and fuel economy. I think a solid cruising speed that would deliver on those two fronts would be 55 mph. Running the numbers, we see that an autonomous truck, cruising for 23 hours at a much slower, safer and fuel-efficient 55 mph would log 1,265 miles during its long day on the highway — pretty much the same mileage our 80-mph driver logged.

Now, obviously, this is a very basic, ultra-ideal comparison without any real-world factors such as weather, traffic congestion or construction entering into my calculations. But it does highlight just how transformative autonomous trucks could be in terms of freight efficiency.

In the experiment I laid out above, the autonomous truck doubled the mileage covered by the HOS-regulated, human-controlled truck while delivering better fuel economy and (in theory) a vastly reduced chance for an accident. Just on the mileage alone, the autonomous truck doubled freight efficiency on this imaginary run. And while I'm the first to admit that we're a long way from seeing fleet efficiency numbers doubled, I hope it will at least get some OEMs and autonomous technology developers talking about what kinds of numbers may be possible in the near future.

About the Author: *Jack Roberts is a transportation journalist who has been covering North American commercial vehicles for 25 years and has developed a reputation as a leading authority/futurist concentrating on new trucking technology, including autonomous vehicles, battery-electric trucks and emerging blockchain technology.*