As autonomous technology matures, it seems likely it will send a “ripple effect” of changes throughout a truck’s architecture. Humans and robots, after all, have vastly different power requirements and expectation when it comes to vehicle performance and the engines and transmissions that deliver it.

As I noted in my last NAFCE Autonomous Blog, autonomous trucks will behave differently and operate on a new timetable compared to human-driven trucks today.

Today truck powertrain design is overwhelmingly based on the needs of a human driver. And so, we have displacements, horsepower ratings and torque curves designed to do a host of different things: Accelerate fairly quickly, cruise comfortably at anywhere from 55 to 80 mph while retaining enough reserve power at higher RPMs to pass quickly or tackle steep grades.

Without human beings in the picture, it seems that power requirements for autonomous trucks will be downgraded significantly over time. To give you some food for thought, if an OEM today brought an engine to market that was incapable of powering a 70,000 lbs. Class 8 truck any faster than 60 mph, people would assume they’d lost their collective engineering minds. And good luck to any fleet attempting to sell its drivers on a truck that can — maybe — do 65 mph, assuming it’s going downhill and has a stiff wind at its back.

But just such an engine would be ideal for a truck that almost never passes another vehicle and is designed to cruise for hours on end at a fuel-sipping 55 mph. So, it seems reasonable to assume that small-bore diesel engines — perhaps in the seven-liter range (or even smaller!) — will become the preferred displacement for autonomous trucks.

It’s also likely that autonomous trucks will be able to get by with these smaller engines thanks to other new technologies that will complement them. Mild hybrid drivetrains with regenerative braking systems that provide a boost of electric torque to a truck’s drivetrain at very low RPMs likely will be a standard spec for autonomous trucks.

Additionally, there are some interesting things going on now with electric drive motors mounted on trailer axles. These motors take energy absorbed by solar panels on top of the trailer and can use it to provide additional power to the drivetrain when climbing grades or accelerating to cruising speeds. I think it’ll be a no-brainer to
add this technology to autonomous trucks when it matures, as well.

And if those smaller engines sound like the perfect formula for traffic congestion, bear in mind that the passenger car world will likely undergo a dramatic transformation toward autonomous vehicles during this timeframe as well. Assuming that we develop a functional smart infrastructure with dedicated truck lanes and fill our roads with large numbers of constantly communicating/coordinate autonomous cars and trucks, it’s likely that much of the driving behavior we take for granted today — speeding, abrupt stops, inconsistent cruise speeds and sudden lane changes, for example — may become memories from a much faster-moving, more chaotic transportation past.

Safety, efficiency and fuel economy will be the watchwords dictating autonomous truck designs of the future. And powertrains will likely be altered dramatically from the ones we know today in order to reflect those new operating requirements.

**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.