



ELEMENTAL CONCERNS

To be successful, autonomous trucks will have to overcome Man's oldest adversary.

As wondrous as autonomous vehicle control technology is, there are still some very elemental problems that have to be overcome before they can reach their true potential moving freight on a national and international scale.

That's because these vehicles rely on a bewildering array of sensors, cameras, and communication systems that, currently, at any rate, are depressingly susceptible to mankind's oldest adversary, Mother Nature herself. Everyday common occurrences such as fog, rain, sleet and snow can quickly accumulate on exposed sensors or cameras and render them unable to "see" the world around the truck and communicate vital operating data back to the electronic control modules (ECMs) in charge of the transmission (which is essentially the brainbox for the entire system), the engine and the steering system. And even if the weather is just fine, operational realities as old as trucking itself, grease, grime, grit and good, old-fashioned dust or even pollen in spring, can be just as big a problem.

None of these problems are insurmountable, of course. Humans have been battling the elements as long as we've been on the planet. And, indeed we still are — with higher stakes than ever before, considering the current climate crisis. But, as far as autonomous trucks go, OEMs and developers certainly will be able to eventually put various elemental control systems on the vehicles; everything from heating elements to defeat ice, as well as wipers and solvent application systems to keep camera lenses clear. But, at least in the early stages of autonomous vehicle deployment, the current assumption is that the trucks will be

deployed in the American Southwest, where the climate — while hostile to humans — is well-suited for keeping sensor obstructions at a minimum.

Moreover, it stands to reason that autonomous trucks will have to have self-diagnosing and reporting components on them that will be light years ahead of anything currently on the market. Such systems will be absolutely essential for their successful use. And the climate and element control systems onboard will be no different.

But as I begin thinking about the environment — including weather — that these trucks will operate in, I realized just how many profound changes this technology will bring to the way the trucking industry operates.

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For starters, consider that the addition of weather- and environmental-control systems on trucks will add yet another layer of maintenance requirements to the vehicles. Admittedly, these will not be highly technical or labor-intensive systems to maintain, troubleshoot or repair. But they will require intensive monitoring on an almost-daily basis to insure they're clean, clear, calibrated and functioning properly and safely.



Making sure autonomous trucks can operate in inclement weather will require a surprising number of changes to fleet and fueling operations, as well as our national infrastructure.

This is another reason I believe we'll have to have dedicated autonomous vehicle technicians standing by at truck stops and fueling stations, to check out these systems and make sure they're good to go while the truck is taking on fuel or charging its batteries. There probably won't be anything like a cab as we know it today on these trucks.

I envision a quick-access panel on the side of the truck with a graphics display screen inside of it that these technicians can quickly access to see if the truck is reporting any issues — large or small — that need to be checked out during its stop. That will likely be secondary to issues reported back to the fleet itself and the truck's operating manager in a mission control room, who already may have sent information to the truck stop, or the display screen, directing the technicians to address other issues, as well.

And it seems like we can't talk about any future-tech issues facing trucking today without sooner or later turning our attention to infrastructure. And guess what? Autonomous trucks are no different.

That's because they require crystal clear, well-maintained roads, lane markings, signage and traffic signals to function properly. In fact, the first-generation of autonomous trucks undergoing testing today are designed to simply pull over onto the median and stop if they cannot safely read and interpret roadway signs and markings.

This means that federal, state and local governments are going to have to invest heavily in road maintenance to make sure that autonomous vehicles (not just trucks) will be able to safely use the roads.

Even with all of these measures in place, there still likely will be times when autonomous trucks simply won't be able to operate — in fog, blizzards and torrential thunderstorms, for example. And that may well require expanding medians on every road in this country to make sure scores of autonomous vehicles will be able to safely pull off the road and wait out whatever inclement weather is in the area.

The promise of an autonomous future for trucking is exciting. But getting to the future will require a vast number of changes in the way trucking operates today. Some of those changes will be dramatic. Some of them will be mundane. But all of them will be necessary.

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.



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