



IN THE BEGINNING

Autonomous trucks won't just appear everywhere at once. Their deployment will be measured, studied and tempered by some very harsh operational realities.

Where will the first autonomous trucks go into service in North America?

It's an interesting question and one that sheds some light on some interesting — and surprisingly mundane — problems autonomous technology developers currently are wrestling with as they race to be first to market with a viable vehicle control system for North American fleets.

While there already have been some very impressive long-haul trial runs, and even runs in congested city applications, the current consensus among experts is that relatively “easy,” long-haul Interstate runs will be the initial application.

The thinking is that these types of runs don't involve a lot of stop-and-go traffic, crowded streets and tight turns, but instead require long periods of consistent cruising speeds with minimal lane changes and speed adjustments. And that thinking makes a lot of sense. However, it is doubtful that we will see coast-to-coast runs by autonomous trucks right out of the box.

Kevin Baney, Kenworth general manager and PACCAR vice president, said recently that he believes the first autonomous truck operations will begin in the southwestern United States, simply because the weather there is more favorable for those operations than in other parts of the country.

And Baney has a point — one that illustrates why several autonomous technology developers, most notably TuSimple — have focused their testing operations in the Southwest United States.

Autonomous vehicle control systems are wondrously complex. They rely on an array of sensitive camera, radar and LIDAR systems to compile information and relay it to the onboard control systems to guide the vehicle down the highway. These sensor arrays are technological marvels, and developers around the country and around the world have done an outstanding job in making them durable and rugged enough to handle tough trucking applications.

However, these systems are limited by some pretty fundamental operational realities. Dreary factors such as rain, sleet, snow, ice, mud, dirt, and good, old-fashioned road film currently are major operational issues that can quickly shut down even the most rugged autonomous sensor array, rendering a truck blind and unable to operate safely without a human driver behind the steering wheel.

“Experts believe that relatively “easy,” long-haul Interstate runs will be the initial application for autonomous trucks, but it is doubtful that we will see coast-to-coast runs right out of the box.”

It is ironic that in an age where developers are actively working on trucks that will one day be able to drive themselves down the road, and deliver



Photo courtesy of Chevron

cargo coast to coast, one of the most fundamental problems they face is simply keeping sensor arrays clean and clear enough to gather the information the truck must have to go down the highway. And, obviously, in the southwestern United States, rainfall, sleet, snow and mud are relative rarities.

True enough, even the Southwest has its own operational issues; dust and dirt are more common problems there. But their accumulated impact on autonomous sensor arrays tend to be slower to materialize, and not as suddenly debilitating as an ice storm can be, striking quickly and rendering a truck inoperable.

Obviously, developing self-cleaning systems for autonomous sensor arrays will be a critical component in the growth of this technology. Simple, scaled-down, windshield wiper systems, heated lenses and solvent spray systems will solve part of the solution. But in the future, we may see the curious situation of human workers at fuel pumps

routinely cleaning sensor arrays with cleaning solutions and rags —much in the same way that pump attendants used to wash car windows at old full-service gasoline stations in days gone by.

It is a stark reminder that no matter how sophisticated and advanced autonomous vehicle systems eventually become, they will require a great deal of relatively mundane human support and service in order to meet the realities of weather, dirt and grime out on the open road.

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.



The North American Council for Freight Efficiency (NACFE) works to drive the development and adoption of efficiency enhancing, environmentally beneficial, and cost-effective technologies, services, and operational practices in the movement of goods across North America. NACFE provides independent, unbiased research, including Confidence Reports on available technologies and Guidance Reports on emerging ones, which highlight the benefits and consequences of each, and deliver decision-making tools for fleets, manufacturers, and others. NACFE partners with Rocky Mountain Institute (RMI) on a variety of projects including the Run on Less fuel efficiency demonstration series, electric trucks, emissions reductions, and low-carbon supply chains. www.nacfe.org