



## AUTONOMOUS BUILDING BLOCKS

*The introduction of autonomous truck technology will likely happen in a series of carefully measured, manageable technology mini-leaps [or steps].*

By Jack Roberts

**A**utonomous trucks are coming. Everyone agrees on that point. When autonomous will arrive in fleet operations on public roadways is another question entirely.

Automation of trucking is a journey, not an end destination. Technology continuously improves. Some industry experts predict limited driverless operations being commonplace in as little as five years. Other, more cautious futurists think a 20- to 25-year timeframe is more likely.

But regardless of which school of thought you find yourself in, it is obvious that the trucking industry will go through a long, complicated and (probably) inconsistent adoption period as the industry comes to terms with autonomous technologies and begins to experiment with their use in freight-moving applications.

Most new technology adoption curves follow a similar path — often referred to by experts as a “messy middle” period, in which humans adjust to new technologies and learn how to use them effectively. This is generally a period of trial-and-error, in that not every new technology pans out as expected. There will be starts and stops during the overall adoption period, as some new technologies fail to perform as well as expected, and other technologies exceed initial expectations.

Sometimes new users find innovative new applications for the technologies that greatly increase their usefulness. As these evaluation processes play out in fleets all over North America and the globe, lessons will be learned, processes and procedures will be refined, and vehicle systems likely will become more integrated, interconnected and effective in making heavy-duty trucks safer and more efficient in terms of freight movement and fuel burned.

The reality is that this process already has begun. While it's true that the tech companies like TuSimple, Outrider and Waymo, as well as “legacy” OEMs like Daimler, PACCAR and Volvo, already are testing autonomous truck technologies in conditions that closely mimic current fleet operations, the real story is the steady rate of adoption of autonomous vehicle systems by fleets on new equipment.

This is a trend that is literally decades in the making. It began with the advent of the first reliable automated heavy-duty truck transmissions and automated engine controls and has blossomed into a stunning array of new vehicle systems currently being evaluated by fleets nationwide.

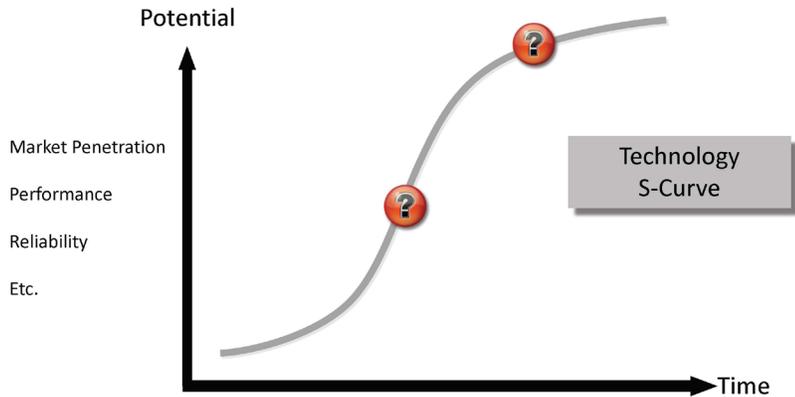
Indeed, the host of new autonomous systems now offered from both OEMs and industry suppliers is breathtaking to behold: Rear-view camera systems; adaptive cruise control systems; “smart” transmissions that use artificial intelligence and predictive analytics to “learn” routes and set powertrains up for optimal efficiency; active anti-rollover systems; blind-spot detection systems; and steering assistance systems are just a few of the new technologies being tested and adopted by North American fleets today.

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This “building block” approach has the benefit of keeping new technologies on a manageable “one-at-a-time” adoption pace for both fleet managers and drivers, who are able to evaluate them to determine if they:

- Offer a reasonable return-on-investment;
- Offer significant, measurable, benefits, including enhanced fuel or freight efficiency, increased safety and a corresponding reduction in liability or insurance costs and improved driver comfort and productivity;
- Are durable and reliable in the field along with corresponding maintenance demands and costs; and
- Have decent value on the resale market.

# Technology S-Curves



Another important, but less visible, result of this approach is that in addition to fleets and drivers becoming familiar and then comfortable with these new technologies, so too are the motoring public, law enforcement officials and legislators. And make no mistake, the attitudes of these three groups of people will go a long way toward accelerating or slowing the eventual adoption of autonomous technology in fleet operations.

And it's worth noting, some OEMs, Daimler and Volvo in particular, already are manufacturing trucks with built-in Level 4 autonomous capabilities, to make it easier for fleets to scale up and spec new autonomous systems and evaluate them for themselves at a pace that is manageable for both drivers and fleet managers.

Barring some massive leap forward in terms of autonomous vehicle technology, it seems like this slow, methodical, “messy middle” approach will define adoption rates for the foreseeable future. And, in a bit of irony, it seems reasonable to assume that most of these add-on technologies, designed to ultimately take drivers out of the equation when it comes to autonomous freight, will initially benefit drivers the most.

To be sure, fleets are rightly excited about reports from TuSimple and other technology developers indicating that trucks under autonomous control get an approximate 10% fuel economy boost on average compared to identically spec'd trucks with human drivers in control. And the same holds true for new smart and predictive cruise control systems, as well.

But in the short run, it will be drivers who benefit the most from add-on autonomous vehicle systems. Studies have shown

that even basic autonomous systems, like a “dumb” automated transmission, can significantly reduce stress and fatigue for drivers, while allowing them to focus more intently on road and traffic conditions — with a corresponding benefit from enhanced safety and fewer crashes, to boot.

Over time, we can expect that many of these systems that are currently available as optional equipment — steering assist and rear-view camera systems, for example — eventually will be offered as standard equipment on vehicles as drivers become used to them, understand the benefits they offer and come to expect and demand them.

Early automation opportunities include slow speed traffic assist like getting through yard facility gates and self-parking and retrieval of trailers in controlled environments like distribution center yards and inside the fences of factories.

Eventually, this will include Level 4 control systems, which drivers will be able to activate in specific traffic, weather and road conditions, and allow a commercial vehicle to drive itself down the road for limited periods of time. From there, as more real-world experience with autonomous vehicles is gained, and drivers begin to understand the technology better, it is likely we will then begin to see a loosening or adaptation of regulations reflecting these experiences.

In the beginning, it may be something as benign as allowing drivers to make telephone or video calls while a vehicle is in autonomous mode. And then, perhaps not long after that, drivers will be able to get up from the driver's seat for limited periods of time to stretch or get something to eat or drink. All of which will eventually lead us to the day when true robot trucks, absent any humans onboard, will begin to haul freight across North America.

**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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