

Pace of Trucking Industry Change About To Hit Warp Speed

General Motors Chief Executive Mary Barra likes to observe that the automotive industry will see more change in the next five years than it has in the last 50.

That's so true, and it applies to all forms of automotive transport, including trucking. Just look at some of the recent changes in transportation.

- When GPS technology – the basis for in-vehicle mapping, predictive cruise control and other technologies – went public in 2001, it was accurate to within 100 meters. Today, it is accurate to within a few meters.
- When Tesla launched 14 years ago, the idea that a company supplying only electric vehicles – a niche market – could have a stock market valuation that rivals traditional car companies such as Ford or General Motors would have been dismissed as a pipedream. No one expected it would be developing a heavy-duty truck.
- More recently, the notion of a company creating a platform that allowed strangers to safely and affordably get rides from strangers would have been laughable. Today, Uber Technologies operates in 683 cities around the world, has an estimated worth of \$70 billion, has disrupted the taxi and automotive industries and is moving into freight hauling.

The world is changing, and the transformation will only accelerate as advances in augmented and virtual reality, artificial intelligence, the Internet of Things, 5G wireless, material sciences, robotics, Big Data and battery technology continue to proliferate. The impact of these technological innovations upon the trucking industry will range from the mundane to the profound.

Volkswagen, for example, is already [exploiting smart glasses and augmented reality to improve the productivity](#) of its assembly line workers. In a move to increase safety, shipping giant [UPS is adding virtual reality](#) to the weeklong basic training course that all new package delivery van drivers attend before setting foot in a real truck. Ford is developing new super-strong, but lightweight materials that will make vehicles more fuel-efficient.

This is just the start. Continued progress in sensor technology will allow trucking companies to make greater advancements in the platooning of trucks. [Peloton](#) already claims to have achieved increases of 7 percent in fuel efficiency through the use of platooning technology that allows a tight formation of digitally tethered trucks to draft off a lead vehicle. Soon, other companies are likely to follow [the lead of Cummins](#) and leverage cloud computing and Big Data to more accurately discern when a truck's tires, brakes, and engine are likely to experience a breakdown. Diagnostic technology will morph into preventative technology.

Within five years, software updates – transmitted wirelessly via 5G networks – will allow engines to be calibrated on the fly and [render visits to the repair shop obsolete](#). In the

same timeframe supercomputing – and, quite possibly, quantum computing – will grow exponentially more powerful. This technological progress, in turn, may facilitate the development and creation of revolutionary battery technologies. By 2021, it is plausible that battery technology will reach the point where it is priced competitively with diesel fuel. Factor in new wonder materials such as graphene and a trucker might be able to drive 600 to 800 miles on a single charge, as well as [recharge their truck's battery in seconds](#).

Today, the U.S. Army, Caterpillar, Rio Tinto and BHP are all experimenting with and using robotic, self-driving trucks in a limited capacity. Longer-term (5+ years), continued progress in the fields of robotics, artificial intelligence and machine learning will move autonomous trucks from today's fringe to tomorrow's mainstream.

The idea of autonomous trucks may still strike some in the trucking industry as either pie-in-the-sky or, at best, a long way off. It is not. Major truck manufacturers and tech companies, including Daimler, Volvo, Waymo and Tesla all are developing self-driving trucks. Tesla is so confident it is asserting that its technology will soon reach the point where it can prevent 90 percent of all accidents involving its vehicles. Knowing no insurance company is likely to offer a 90 percent reduction in its premiums, Tesla plans to integrate insurance into a flat, low annual "maintenance" fee.

Autonomous trucks offer tantalizing cost savings. They will save lives by having fewer crashes and they won't require sleep, extended breaks, get sick or drive at anything but the optimal level.

Opponents of self-driving trucks may cite the lack of proper infrastructure or regulatory or legislative hurdles as barriers to overcome. To be sure, these are legitimate points, but some states, including Michigan, California, Nevada and Ohio are [already building out vehicle-to-infrastructure networks](#), and in late July the first bill regulating autonomous vehicles passed a committee of the U.S. House of Representatives. With continuous improvements in autonomous trucking technology and the physical infrastructure being built out, the eventual passing of some form of legislation by the full Congress will inevitably take place.

If the American Trucking Association's claims about the industry facing a shortage of 174,000 truckers by 2024 are correct – and assuming the industry can't continue to raise wages in an effort to attract new drivers in the industry – will trucking companies have any alternative but to transition to autonomous vehicles?

The coming changes to the trucking industry won't merely be confined to the design or operation of the truck. The cargo on those trucks will also change. To understand the transformation, consider ice. Before the invention of refrigeration, the shipping of ice was an important and profitable business. After refrigerators found their way into hotels, restaurants, and homes, the demand for ice evaporated.

Fortunately for the shipping and trucking industries, the impact was barely noticed because refrigeration also opened up vast new markets as consumers began clamoring for vegetables, fruits, and beverages that could only be transported with the assistance

of refrigeration.

Something comparable is about to happen as a result of two new and unrelated technological developments. The first involves additive manufacturing – also known as 3D printing. In early 2017, Adidas announced that it had [successfully printed 5,000 pairs of shoes](#). It is a small number, but 3D printers are getting faster (up to 100 times faster), and they are now capable of printing 160 different materials.

What this implies is that soon everything from shoes and tools to wind turbines, jet engines and [even houses may be printed](#) closer to their end market. As this trend grows, the number of items, parts and products [that need to be transported will decrease](#). One [study](#) has even estimated that 3D printing could eliminate 25 percent of truck shipments. Much the same is true due to the advances in urban agriculture and vertical farming. A handful of vertical farms are already proclaiming that they can [produce crops 30 to 100 times more efficiently than traditional farmers](#). If so, the days of shipping tomatoes, lettuce, broccoli, avocados and other produce thousands of miles are numbered. Longer term, extraordinary advances in artificial cheese, milk and meat could do the same to animal-based products.

It may at first appear that these trends portend a bleak future for the trucking industry, but that isn't necessarily the case. The hardest thing to imagine about the future are those things that don't yet exist. If millions of people are purchasing 3D-manufactured items and locally grown crops, it is possible that they will have additional disposable income with which to purchase other items that can't be manufactured or grown locally. While it is possible these new products might be shipped via Elon Musk's [Hyperloop](#) or even distributed by Amazon drones through Jeff Bezos' patent-pending airborne fulfillment center, it is more plausible that they will be shipped via trucks. Furthermore, existing products (even 3D-printed items and locally grown produce) will still require transportation for the last few miles. To paraphrase King Charles VII of France, "Trucking is dead. Long live trucking."

Editor's note: [Jack Uldrich](#) is a futurist and author, and keynote speaker. His latest book is [Foresight 2020: A Futurist Explores the Trends Transforming Tomorrow](#).