

Transportation makes its mark on digital disruption

The innovations in the transportation industry are moving fast. Don't wait for the tech to come to you.

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Transportation is facing major digital disruption, thanks to the likes of Uber, Lyft, Zipcar, and even [BMW](#). Uber and Lyft struck at the right time and with the right solutions. First, they reduced the friction of hailing and paying for a taxi. Second, they disrupted the entire taxicab business model by introducing a new supply source: anyone who wants to offer his or her vehicle and services.

In exploring the digitally fueled future, we will also draw out those aspects of transportation's digital transformation that are common to other industries like manufacturing, utilities, and even retail banking. And we'll see that disruption in the transportation sector makes clear that CIOs must take an aggressive interest in keeping up with change.

Self-driving vehicles

At least once a week, there's a news report regarding autonomous cars. It might be news about the [Google Self-Driving Car Project](#) or rumors around a similar effort underway at Apple. But lately, the news goes beyond cars: For example, Mercedes just completed successful trials in which [a self-driving bus](#) made its way through the center of Amsterdam.

Rolls-Royce, among others, is working on [self-driving container ships](#). Meanwhile, the British Navy is prototyping [small drones](#) that scour the seas around Europe looking for boats used to smuggle people ashore. A number of countries are working on self-driving military vehicles, both for troop resupply and for street-to-street

fighting. Ultimately, [self-driving vehicles](#) will change much more than whether our hands are on the wheel.

Sharing

Research shows that younger generations are more willing to use [shared resources](#) such as Airbnb. (In this [in-depth Pew report on the digital economy](#), greater uptake among 18–44-year-olds of sharing apps and services can be seen throughout.) It's widely expected that the digitally driven "sharing economy" will continue to grow.

We already have very successful shared bicycle programs in many major cities like Paris (which started the trend in the first place), London, and Barcelona. Remaining innovative, [Paris introduced shared e-cars](#), and the city recently announced it will be [introducing shared e-scooters](#). City transportation authorities favor two-wheeled vehicles because you can get more on the roads and because you can park them more densely—so, if Paris is successful, expect to see shared e-scooters in other cities as well.

Digital technology is being applied to more than the sharing of vehicles, though. In cities like London, people offer their parking spaces for rent. Such schemes are highly successful, but they're only made possible by web and mobile technology. And the enthusiastic embrace of younger users confirms that we're seeing the future take shape.

Resource matching

The market-disrupting element of both Uber and Lyft is their ability to find a "best match" between someone wanting a ride and the new source of ride providers they have created. Increasingly, this element is being applied to areas of transportation other than ride services and sharing.

- A UK company called [Deliveroo](#) is successfully delivering take-away meals in 12 countries. Uber has quickly followed suit, with a delivery service in several North American cities called [UberEats](#) that's now headed for London.

- Apps such as [ParkingPanda](#) in the United States and the [City of Perth Parking mobile app](#) in Australia make it easier to find a parking space in a large city by allowing users to locate, reserve, and pay for spots using their mobile devices.
- Because of the limited range of electric cars and the time they take to recharge, it's important that e-car owners know where the nearest, unused charging point is. Apps are popping up to meet this demand, including a [partnership between Tesla and Airbnb](#).

Of course, disruption never stops. The likes of Deliveroo and UberEats may have a limited window before food delivery drones arrive to disrupt them.

Advantages for drivers

For owners/drivers of vehicles, all this automation brings several key advantages to what we do in our vehicles, how we care for them, and how safe we—and those around us—are.

1. In-car productivity. If our cars do the driving, do we just lean back and enjoy the scenery? More likely, we'll turn to our ever-more-powerful and connected entertainment and work systems. No more dialing into conference calls, unable to see the slides being presented. Our cars will have 5G-based communications, and, on the lovely in-car screens, we'll be able to work, play, or be entertained. Because it may be a while before everyone has a self-driving car, voice recognition technology like that in Google Now, Apple's Siri, and Amazon's Alexa is increasingly valuable.

2. Maintenance. We'll increasingly see predictive maintenance mitigate breakdowns through the use of data from sensors that will predict when a crucial part is about to fail. This is about more than auto owners missing an oil change; predictive maintenance will help manage the car fleets of traditional rental agencies and upstarts like Zipcar. It will help train and aircraft providers avoid not only the expense of emergency repairs, but also the loss of revenue and customer loyalty due to a breakdown.

GE is already using this technology in its latest locomotives, and, outside transportation, water utilities use it in their pumping stations. HPE uses it with its large servers. FlowServe, a maker of industrial pumps, valves, and more, uses the

augmented reality technology that's enabling *Pokémon Go* to superimpose diagnosis and repair information onto the reality of a piece of equipment. (Read about it, and other companies' efforts, on [Internet of Things Institute](#).) Thus, even lightly trained engineers can fix more problems. Yes, believe it or not, there's huge applicability for augmented reality outside of chasing Pokémon.

3. Safety. Currently, one of the key uses of the Internet of Things (IoT) is in making factories safer. Sensors and our ability to automatically "see" using video images will allow us to make transportation safer, too. In Auckland, New Zealand, video images of train tracks at stations are used to automatically "see" when someone falls onto the train tracks.

Last year, 436 cyclists were seriously injured or killed in London, many of them by trucks. Automakers are also working on systems that automatically put on a car or truck's brakes when it gets too close to a cyclist. Volvo introduced [cyclist detection technology](#) in 2013.

And, of course, self-driving cars mean we can reduce drunk driving.

Advantages to the public sector

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Advantages to the companies that make vehicles are obvious: Digitally fueled products can drive faster, smarter product life cycles with tighter feedback loops. More accurate information about how vehicles are maintained and driven will let manufacturers make improvements. Measuring how vehicles react and behave in-use could drive software updates that would fine-tune your car's performance.

But the sharing economy also has implications for how government manages transportation. Some large cities have carpool lanes to reward ride-sharing in an effort to decrease congestion and reduce carbon dioxide emissions. Singapore heavily taxes car ownership—a strategy other municipalities might emulate to drive

users to new alternatives. The plus side to digital disruption of transportation brings governments several opportunities:

1. Traffic flow. As we increase the number and sensitivity of traffic sensors around our cities, and the power of the data analytics behind them, cities can optimize traffic flow—by, for instance, giving priority at lights to bicycles and e-bikes. New Zealand's Auckland Transportation Authority is working on a system to use automatic video recognition to "see" when there are bikes at a light, and give them priority.

The city of Reading in the UK has introduced smart signs on which routing information is displayed using LEDs and is dynamically changed to optimize the flow through the city.

2. Transportation system design. We can use advanced data analytics to improve our transport systems. We might, for example, redesign the bus routes in central London, especially given that some of them have been in place since the days of horse-drawn carriages. Or we could analyze walking patterns to improve the environment for pedestrians in cities. In Bucharest, Onyx Beacon is trialing a system that uses beacons and smartphones to help [visually impaired pedestrians](#). Maybe the data from such a system could be used to improve accessibility of cities, too.

A high-speed evolution

When digitization comes to the manufacturing sector, many of its impacts won't be directly felt by customers because it will be areas like supply chain that will be affected. This isn't the case for the digital transformation of transportation: It will remove the need to be able to drive, it will change how we pay for transport, and it will force us to change our views on ownership.

While transportation may look like it has little in common with, say, banking, its digital transformation shares many aspects common to all digitizations, including:

- **Experimentation:** Vehicle manufacturers and cities are running experiments to determine the best way to use digital technology. No one knows for sure how

different solutions will "take"—will customers like them, will they pay for them, will they consider them too intrusive, will they consider them safe enough?

- **The application of data science:** Self-driving cars use machine learning. Traffic control and safety systems "understand" high-resolution video, Uber dynamically sets market price during demand surges, and Google Maps uses advanced, fastest-path algorithms.
- **IoT:** As in the fields of manufacturing, maintenance, and utilities, we will see the use of many types of IoT devices, such as sensors, radars, video, and beacons.

Another crucial commonality is that businesses can't hesitate to act. The technology digitizing the transportation industry is moving so fast across so many varied applications that it's simply not practical for companies to wait for the technologies to come to them. Instead, they must actively put in place digital technology scouting—and they must give their employees time and resources to "play"—to explore how the latest technology can be used for digital transformation.

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