

Digital innovation and automation

Impacts of disruption on the core infrastructure investor

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IN BRIEF

- Growing use of big data, artificial intelligence and automation appears to be generally positive for core infrastructure investments.
- Utilities could benefit from digitization, which could reduce overhead and encourage regulators to permit greater spending on upgrades.
- Transportation companies could make better use of customer data and automation to expand their reach and increase efficiency.
- Self-driving cars could have a substantial impact on a range of infrastructure investments, including parking garages, toll roads and rail.

DISRUPTION THREATENS ALL INVESTORS. EVERY INDUSTRY AND SECTOR FACES DISRUPTION RISKS FROM NEW TECHNOLOGIES, COMPETITORS, POLITICS AND REGULATIONS. We believe that core infrastructure investments are relatively less vulnerable because they are grounded in physical assets that provide essential services.¹ Nevertheless, they are not immune. Investors should consider the potential for disruptive changes in every underwriting, both for the individual asset and for the broader portfolio. As always, a diversified portfolio is central to mitigating downside risk.

Here, we explore automation and digital innovation—the sweeping changes wrought by customers' greater use of the internet and associated advances in big data and artificial intelligence—and the risks and opportunities they present to infrastructure investors.

INVESTMENT BACKDROP: INFRASTRUCTURE INDUSTRY TRENDS

Infrastructure companies are not immune from the disruptive changes that have buffeted media companies, the taxi industry, brick-and-mortar stores and financial services. Ride sharing could reduce demand for parking. Airport retail offerings may compete with the online variety. Companies may be forced to contend with social media's greater power to broadcast criticism and harness opposition to new infrastructure developments. But overall, we expect the trend toward digital innovation, automation and artificial intelligence to open up opportunities for core infrastructure investors.

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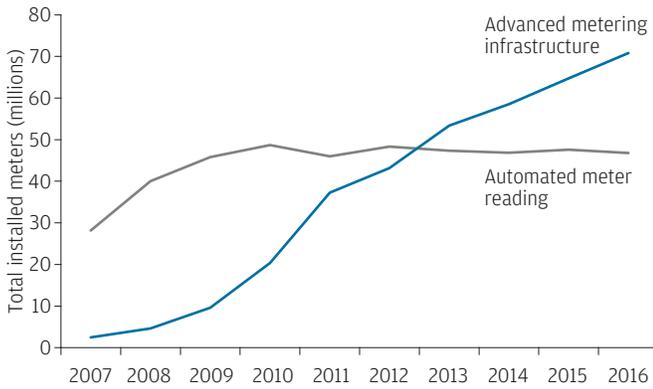
¹ We consider investments to be core if their cash flows are forecastable for at least 10 years with a low margin of error.

Utilities

Online bill payment, automated meter readers, electronic alerts to customers and improvements in asset tracking have all helped to reduce overhead at utilities. Research suggests that customers who switch to automated billing increase their consumption.² Utilities have expanded their rate bases by investing in smart meters, which track usage at granular intervals, and by upgrading to smart grids that can react dynamically to changes in consumption. Smart grids and meters remain significant opportunity areas for many utilities. While advanced two-way meters have taken off in the U.S. over the past decade, half of households still lack them (EXHIBIT 1).

Utilities can benefit from investments in smart technologies

EXHIBIT 1: INCREASING U.S. INVESTMENT IN SMART METERS



Source: U.S. Energy Information Administration, J.P. Morgan Asset Management; data as of December 2017.

Airports

Better use of customer data could help airports and airlines better cater to passengers and encourage end-user travel. For example, airlines can better estimate true point-to-point demand, allowing them to cut out some inefficient hub connections. As a result, some airlines have begun to transition from wide-body planes like the A380 toward narrow-body aircraft that can serve smaller airports. Airlines can also use larger data sets to better price-target their customers.

Container ports

Automated processes have helped seaports to move goods faster and more cheaply. While unloading ships at some terminals—like those in Rotterdam—requires very little human intervention, other ports—especially in the U.S.—have considerable room for progress.

ARTIFICIAL INTELLIGENCE: THE DISRUPTIVE IMPACT OF SELF-DRIVING VEHICLES

We expect most companies—online or offline—to ultimately incorporate some level of artificial intelligence (AI) into their businesses, reshaping the associated jobs. Of AI-based technologies, self-driving vehicles stand in a class of their own in their potential to cause drastic and relatively near-term upheaval across several infrastructure sectors. Google, Uber and Tesla have all begun testing autonomous vehicles, and traditional automakers are investing heavily to stay competitive. Millions of driving jobs may eventually disappear, and with fewer professional drivers, the cost of transport would fall dramatically. The resulting changes for infrastructure investments may be significant.

Parking garages

As autonomous vehicles begin providing extremely cheap, on-demand trips, consumers could eschew car ownership in favor of ride-hailing, even in suburban and rural areas. Fewer cars could serve larger populations. Parking garages, a staple of many infrastructure portfolios because of their historically stable cash flows, could feel a substantial impact. Passengers may be reluctant to park in an expensive garage in a city center when their car can park itself someplace cheaper (or better yet, pick up another ride).

Toll roads

Driverless vehicles could make travel cheaper and roads less congested (by allowing vehicles to travel closer together), both of which could boost demand for car and truck transport. More car and truck trips would benefit toll roads with quasi-monopolistic market positions. Some toll roads may be vulnerable, however, if reduced congestion makes passengers less willing to pay to use them to bypass traffic.

² Steven Sexton, "Automatic Bill Payment and Salience Effects: Evidence from Electricity Consumption," *Review of Economics and Statistics*, May 2015.

Freight and passenger rail

Cheaper autonomous truck transport might take market share from freight rail. The outlook for passenger rail is mixed. Less highway congestion may shift passengers from trains to cars. However, passengers may be more inclined to use rail to travel to or from dense city centers if they can rely on autonomous vehicles to transport them to final destinations far from the train station.

Airports and container ports

Many airports may see a drop in their revenues from on-site parking, though they may be able to recoup lost parking fees by charging for drop-offs and pickups. Container ports may also need to adapt to a changing mix of truck and freight rail oftakers.

Electric vehicles

The introduction of self-driving capabilities is also likely to accelerate the shift to electric vehicles (EVs), because EVs used as for-hire cars would probably spend more time on the road, and so could better offset their higher up-front costs with lower maintenance and fuel costs. This could have important implications for infrastructure investments. A relatively rapid transition to EVs would likely reduce demand for oil refineries, pipelines, tankers, trains, ports, storage facilities, and drilling equipment and services. Cheaper jet fuel and marine diesel oil could boost demand for airports and seaports, while cheaper cars could boost demand for toll roads.

INVESTMENT IMPLICATIONS

Disruptive forces are often interrelated, so one shift within an infrastructure portfolio may help to offset another. For example, advances in battery storage may mitigate the effects of climate change. In the context of an overall portfolio, many sources of disruption support economic growth. If a diversified infrastructure portfolio is negatively affected by disruption, an investor may see offsetting gains in other asset classes. We believe core infrastructure assets are less vulnerable to disruption than many other investments, especially when coupled with long-term contracts and stable regulatory frameworks. Past underinvestment in infrastructure gives governments a strong incentive to encourage private sector capital. Nevertheless, investors should constantly assess new risks, and diversify to mitigate volatility.

IMPACTS OF DIGITAL INNOVATION AND AUTOMATION ON INFRASTRUCTURE INVESTMENTS

Vulnerable	Likely to benefit
Urban parking garages	Utilities
Airport parking	Airport passenger growth
Toll roads without quasi-monopolies	Toll roads with quasi-monopolies
Freight rail	Container ports


PORTFOLIO INSIGHTS
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