

Game changer

How to think about the impact of autonomous vehicles on a real estate investment strategy

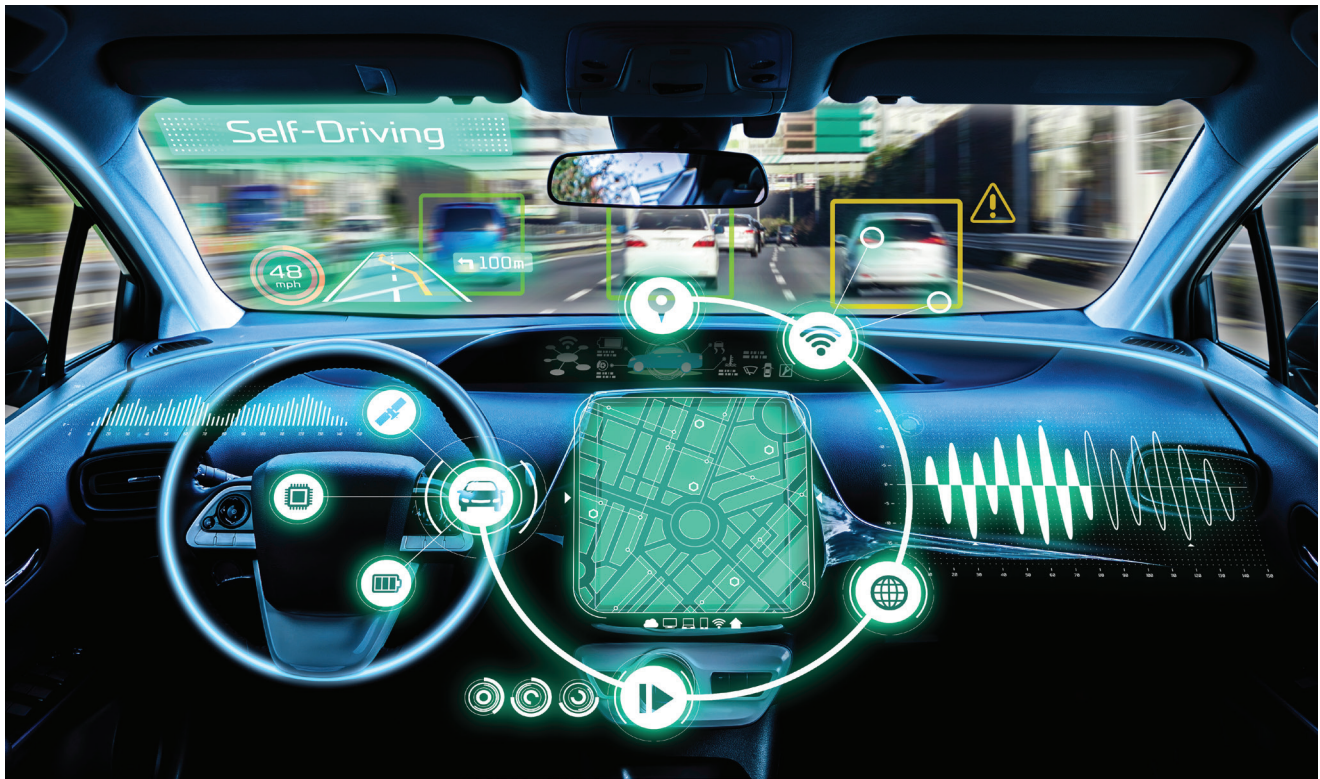
by Hamel Shah and Isaiah Usher

The buzz around autonomous vehicles, which drive without the need for human interaction, seems to be everywhere, with major automakers and technology companies joining forces to revolutionise the transportation industry. They promise to change the way we travel, while saving lives, conserving resources and freeing time for more productive uses along the way.

Autonomous vehicles are expected to save lives by reducing accidents, 94 percent of which are attributable to human error and cause more than 1 million deaths worldwide per year. By removing human error from driving, autonomous vehicles are also anticipated to travel faster and more closely together, increasing existing road capacity. They will also save fuel, reducing costs and greenhouse-gas emissions. In the United

States alone, passenger cars use 143 billion gallons of gasoline per year, at a cost of more than \$500 million (€434 million), and autonomous vehicles could increase fuel efficiency by more than 20 percent. In addition, US drivers spend an average of 75 billion hours driving annually; in a self-driving car, that time can be spent productively, catching up on email or relaxing.

Many barriers must be overcome, however, before roadways humming with autonomous vehicles become a reality. The most obvious barrier is the technology for fully-autonomous driving itself, which remains out of reach, albeit advancing in leaps and bounds. In addition, consumers will need to accept this new mode of transportation, the legal system will need to account for automated driving, and infrastructure will require substantial upgrades. Although



many describe the benefits of autonomous vehicles and how society will be transformed, it will take mass adoption to bring them to fruition, which will take time — perhaps longer than many commentators anticipate.

As investors know well, “being too early is indistinguishable from being wrong” — investing today assuming widespread autonomous-vehicle use is imminent could lead to poor results if mass adoption takes substantially more time than predicted.

While the effect of autonomous vehicles on real estate promises to be substantial, this technology presents a challenge for real estate investors, as both the timeline and scale of adoption is unknown. As investors know well, “being too early is indistinguishable from being wrong” — investing today assuming widespread autonomous-vehicle use is imminent could lead to poor results if mass adoption takes substantially more time than predicted. Given this challenge — in which the potential impact is large, but the timescale is uncertain — how should investors think about the effect autonomous vehicles will have on their real estate investment strategies?

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The proliferation of autonomous vehicles is expected to affect individual travel decisions as driving becomes safer, cheaper and more pleasant. Over

time, many believe private vehicles will be replaced by fleet-based, on-demand autonomous-vehicle services, further increasing the convenience and lowering the cost of travel. Moving goods will also become more efficient, making the delivery of products purchased online from e-commerce operators cheaper and more convenient.

These changes will have a profound impact on land and property values, building design, and tenant demand for buildings with different sets of amenities and attributes. Furthermore, autonomous vehicles are expected to have large effects on specific property types.

Many have noted real estate value premiums associated with transit-oriented properties will decline, and the value of locations not served by public transportation will increase. As commutes become easier and more pleasant, people may choose to live farther from employment centres to access cheaper or amenity-rich housing. Experiential retail destinations, such as high-end malls, are expected to thrive as autonomous vehicles facilitate longer travel times for leisure, and neighbourhood and community retail is expected to suffer as the convenience of these locations, typically within a short distance of dense housing areas, becomes less important.

Parking needs will decline upon the mass adoption of driverless vehicles, with many analysts projecting a reduction between 50 percent and 90 percent in the number of spaces required. This promises to free large parking areas for development. Parking currently accounts for 15 percent to 30 percent of urban land in the United States. The impact will be highly asset-specific, but the surge of new land would negatively affect values

(where higher and better uses are lacking), and allow property owners in attractive locations to develop with increased density and add to the value of their assets.

Real estate businesses that cater to long-haul travellers, such as billboards or travel rest-stop operators, will likely suffer as travellers' attention faces inward and driving becomes a significantly less demanding and less stressful experience. Self-storage real estate will be challenged by new supply emerging from single-family-home garages, apartment parking spaces and parking structures. Data centres and the tower sector, however, are well positioned to benefit from increased demand. Some estimates indicate, at a 25 percent adoption rate roughly five years from now, data requirements in the United States will increase by 25 times compared with current levels — from 1,600 petabytes to nearly 40,000 petabytes per month of mobile data consumption.

The prevailing view of autonomous vehicles is they promise to disrupt real estate in a major way — and we agree. From a strategic point of view, however, we think a critical question is not only “what” will happen but also “when” will it happen?

When will autonomous vehicles be the new standard on the road?

The many benefits of autonomous vehicles, along with the rapid advances that have been made in self-driving technology, appear to make mass adoption inevitable. Many have forecast mass adoption could begin as early as 2030, with only fully-autonomous vehicles manufactured by that point. The barriers to mass adoption, however, are significant and present very real challenges that could drag out the timeline by decades. This new form of technology is exciting and promising, and those in the technology and automotive industries reflect this — and tend to be overly optimistic.

The technology will have to become not only reliable, but also safe and secure in the face of threats that could include glitches, hacking or terrorism. Furthermore, the legal and regulatory environment for automobiles will have to be adapted substantially to account for fully-autonomous cars. Although technology firms can rapidly iterate and improve their autonomous-vehicle algorithms, governments and courts around the world are likely to move at a much slower pace. In addition, substantial infrastructure improvements will have to be made to facilitate self-driving cars. Wireless Internet connectivity will need to be seamless across every kilometre of road, and even basic upgrades, such as ensuring roads are clearly painted so sensors can detect lane markings, will take time and stretch public budgets. Then there's public perception and acceptance. With several unfortunate incidents where people have been injured or killed by autonomous vehicles during testing, people need to be

convinced of the technology's safety and utility before mass adoption becomes a reality.

These barriers could mean, instead of mass adoption beginning in about a decade, it may take 20 to 30 years or more for autonomous vehicles to enter the mainstream and become the standard.

Factoring in the impact of autonomous vehicles on investment strategy

Major technological disruptions, such as autonomous vehicles, put investors in a challenging situation. On the one hand, autonomous vehicles promise to revolutionise transportation, have a profound effect on the real estate sector and strongly influence property investment returns. On the other hand, the timelines for mass adoption and, as a result, the largest impacts on real estate, are highly uncertain, and the exact implications for real estate are unknown.

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It appears clear that investors — particularly institutional investors with long-term views — should start to factor autonomous vehicles into their investment strategies to future-proof their real estate portfolios. But how can you do this, given the uncertainty around the timing, scale and specific impact of autonomous vehicles on real estate?

We believe the answers lie in considering these important questions: What areas of real estate are likely to be affected by the industries that are the earliest adopters of autonomous vehicles, and are we able to foresee the likely impact that adoption will have? And by inverting this question, what areas of real estate are least likely to be affected materially by even the widespread adoption of autonomous vehicles?

Logistics: A good place to start

We find most commentators spend their time looking at self-driving cars and the effect they will have on real estate as people's preferences change with respect to where they live, work and spend their free time. We think it is more useful, however, for investors to look at autonomous trucks and the impact the adoption of self-driving technology will have on logistics real estate.

The logistics industry is likely to be an early adopter of automation and self-driving technology.

Fuel and labour are the two largest cost components of transporting goods by road, and both costs

promise to be reduced through automation, incentivising businesses to explore them. Furthermore, neither full autonomy nor mass adoption is required to unlock benefits for logistics businesses. Conditionally- and highly-automated trucks, for example, which can operate autonomously in limited environments such as dedicated areas or highway lanes, could be used even as most cars on the road are driven by people and while still relying on human intervention for navigating urban environments.

Self-driving technology for trucks is anticipated to achieve three main objectives: improved safety, increased fuel efficiency, and greater travel per day by reducing stress and fatigue for drivers. This promises to significantly reduce the expense of transporting goods by reducing fuel and labour costs.

Lower transportation costs will mean, at a given level, a supply chain will need fewer warehouses. It will be critical for real estate investors to identify those sites that will be made obsolete by autonomous-vehicle trucking technology, and those that will likely increase in size and importance.

It appears that clear investors — particularly institutional investors with long-term views — should start to factor autonomous vehicles into their investment strategies to future-proof their real estate portfolios.

We believe increased range and lower costs will mean hub-warehouse locations — often selected because of their ability to cover a large population within a single day's drive time — will become less important, and occupiers will choose these types of sites based on the ability to secure low rents. Landlords for this type of logistics real estate will be forced to compete on price and, in periods of limited demand for space, rents have significant potential to fall. This presents risk for these warehouse locations, as current tenant demand is predicated on the regulatory and physical restrictions created by current transportation technology.

We think investors should focus on transmodal locations, which allow for goods to change from one form of transportation to another. One example is sites proximate to sea or inland ports. Sea and rail are anticipated to remain the most efficient ways to move goods for decades to come, and port infrastructure is immovable; logistics assets will remain valuable so long as the infrastructure is there. Another important example is last-mile distribution facilities near major population centres, which are critical to shifting goods from long-haul trucks to urban delivery vehicles. We believe focusing on logistics sites near immovable critical infrastructure — ports, production facilities for goods, or end consumers — will limit the risk of disruption by autonomous-vehicle technology.

Autonomous vehicles have the potential to spearhead a transportation revolution that could send the personal car and car parks the way of the horse and stables.

City density, transit and insulation from autonomous-vehicle influence

The world's densest cities with sophisticated transit systems promise to be the least affected by autonomous vehicles over time. In the face of technological disruption, while most commentators spend the majority of their time examining what will change and what the effects of that change will be, we find it often more valuable to focus on what we believe will not change.

Focusing on dense urban areas within the world's premier and most built-up cities with sophisticated — and typically primarily underground — public-transit systems is likely to mitigate the risk of major impact from autonomous-vehicle technology. These cities, including Hong Kong, London, New York City, Shanghai, Singapore and Tokyo, are insulated from the impact of autonomous vehicles because the sheer density of people who need to move within the city necessitates mass transit.

Conversely, the effect of autonomous vehicles will be greater in major cities that are less dense and have less-sophisticated public-transportation systems, which increases the risk to individual real estate investments posed by this new technology. Cities such as Los Angeles and Manchester, England, are likely to have their transportation infrastructure — which is typically characterised by limited mass-transit options — revolutionised by the adoption of autonomous vehicles, increasing the potential a specific property will be affected in a substantial way. In Asia, such major markets include second-tier Chinese cities (such as Chongqing and Shenzhen), Delhi, Jakarta, and Kuala Lumpur.

Autonomous vehicles have the potential to spearhead a transportation revolution that could send the personal car and car parks the way of the horse and stables. Self-driving technology promises to be a game changer for real estate — the question is when. Focusing on industries likely to be early adopters, as well as locations that promise to be the least affected by this technological paradigm shift, will allow investors to develop insightful views on the risks and opportunities presented by autonomous vehicles for their real estate investment strategies. ♦

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