Shared and self-driving cars

A game changer in real estate and area development?

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Shared and self-driving cars have moved from fantasy to reality. Car-sharing initiatives from the likes of Uber, Lyft, Snappcar, and Blablacar are rapidly changing the perception of car ownership and car usage. Combined with the application of autonomous vehicles, which are already operating in some places, this might well be the next game-changer in real estate and area development. We expect large-scale pilot projects in Europe in the coming years aimed at getting a better understanding of the related challenges and opportunities that lay ahead.

What can real estate developers, investors, and government bodies expect from this potentially disruptive force, and how can they prepare themselves? What do we already know and what can we expect in the short and longer term?

Transportation technology drives area development

Throughout history, the available modes of transportation have driven area development. In the colonial times, cities clustered around ports as ships were the main means of delivering supplies and residents. With the introduction of streetcars, cities developed along radial streets that extended outward from the city center in a star-shaped layout. And when owning a car became the norm, urban sprawl developments started to prevail.

Cities have thus been forced to adapt from a primarily pedestrian-oriented environment to an auto-centric lifestyle with a continuously growing demand for parking and road capacity. In order to provide for future-proofed real estate and area development, both real estate developers and (government) urban planners have tried to predict these lifestyle changes resulting from progress in transportation technologies. Currently many of them point to the rapid expansion of shared and autonomous road vehicle initiatives as the new disruptive force. This raises the question: are we in the midst of a paradigm shift? In order to answer this question, we have to look at how travel patterns have changed over the years.

Commuting time has remained approximately constant over time

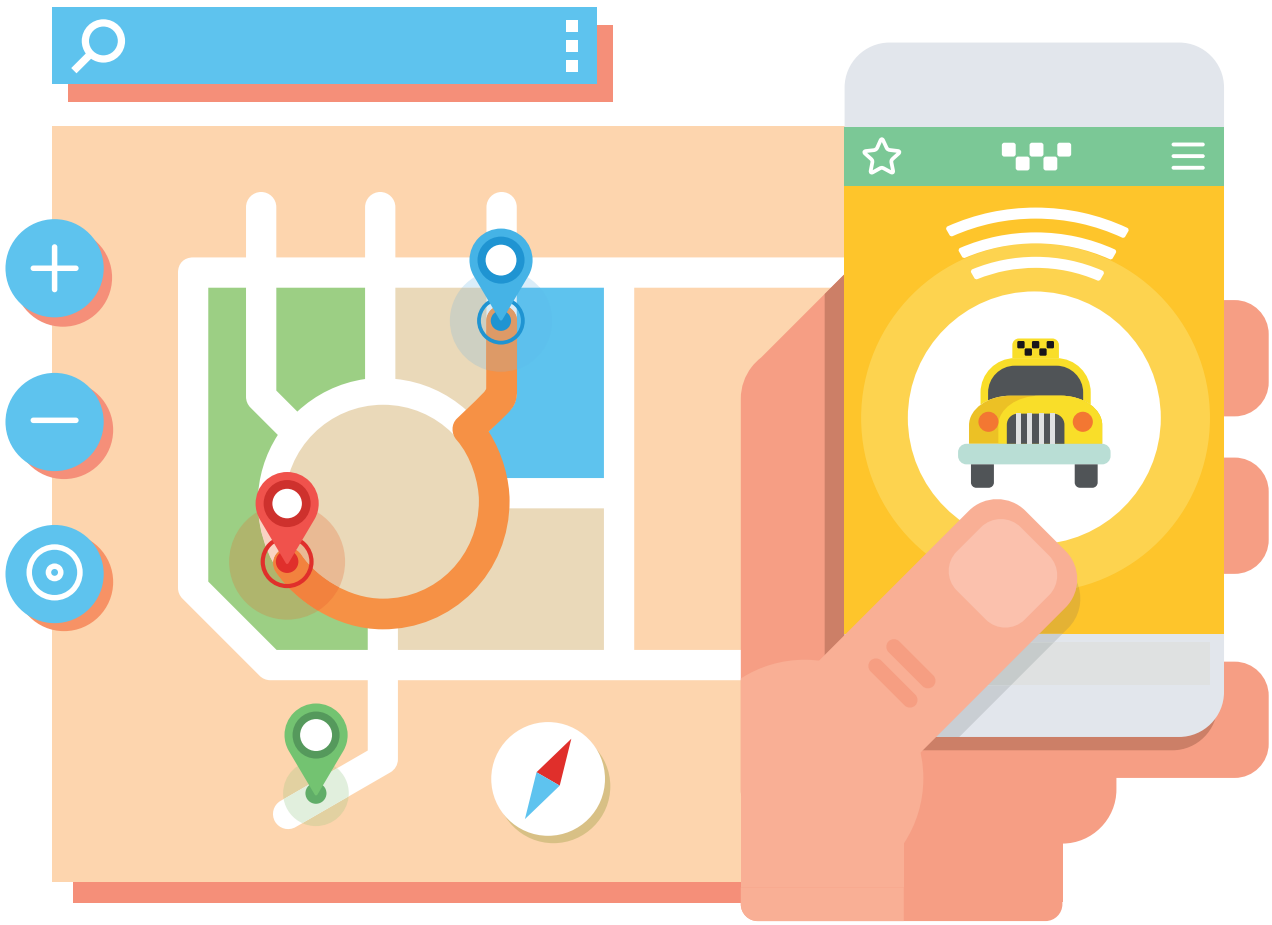
Over the years, people have gradually adjusted their lives to their living conditions, including the location of their homes relative to their workplace, such that the average commuting time stays approximately constant at one hour. This constant is known as Marchetti's constant and is important for policymakers as it casts doubts on the contention that investment in infrastructure saves travel time. Instead of actually saving travel time, people seem to invest this time in travelling longer distances. This partly explains why expanding highways only relieves congestion in the short term. As people adjust to the new situation by using the newly available highway capacity to travel further and more often, a new equilibrium of road congestion will be reached in the longer run. But to what extent will Marchetti's constant also hold if travelers could be completely productive during their travels?

Shared and self-driving cars will increase the number of vehicle movements

Nowadays car users generally drive their own cars, and as a result they have little else that they can do during this time. But if autonomous vehicles would pick up passengers at home, without any waiting time, and enable them to fully focus on things other than driving, this would change. Depending on the comfort level of the vehicle, the car could then become a place to work or even to sleep. Arguably this would reduce the perceived travel time to almost zero.

The latter is likely to encourage current car users to travel longer distances and more often. As vehicles will also run empty now and then, for example for repositioning, the total number of vehicle movements by current car users will significantly increase. Additionally, a large share of non-car users can be expected to switch to the use of shared and self-driving vehicles. This group consists of people that currently prefer other modes of transport and people unable to drive themselves, such as elderly, disabled, children, as well as those who are under the influence of medicine or alcohol. As a result of these changes, the total number of miles driven is likely to increase. It remains to be seen if additional road capacity is needed.

The expected increase of (self-driving) car usage could partly be offset by the application of new technologies that will make traffic flow much more smoothly.



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The expected increase of (self-driving) car usage could partly be offset by the application of new technologies that will make traffic flow much more smoothly. An example of such a technology is "platooning." This allows a group of vehicles to travel together (in a platoon) at high speed and with short distances between the vehicles. Each vehicle communicates with the other vehicles in the platoon. There is a lead vehicle that controls the speed and direction, and all following vehicles (which have precisely matched braking and acceleration) respond to the lead vehicle's movement. As a result of platooning much less road capacity is needed to accommodate the same flow of vehicles. In addition, it also increases the safety resulting in fewer accidents, and thus, less congestion.

It is hard to predict to what extent these new technologies will offset the expected increase in car use. Therefore, it remains to be seen if new road capacity will be required. However, it is clear the layout of the road network will have to change. Developers and urban planners can already anticipate the requirements of the future by looking at recent trends.

Car ownership will progressively decrease, especially in Western cities

After a period of suburbanization, particularly in the United States, we are currently in a phase of (re)urbanization, with virtually everywhere in the world people migrating to big cities. In addition, especially in Europe an increasing share of the inhabitants of these cities does not own a car.

Instead, they increasingly rely on public transport, cycling, and ride-sharing. Furthermore, as the average car is still used only 50 minutes a day,[1] there seems great potential for further growth by ride-sharing companies and it comes as no surprise that they are rapidly gaining market share.

Additionally, several ride-sharing companies are already testing autonomous taxis, like Uber in Pittsburgh and nuTonomy in Singapore, and are likely to do so in Europe as well in the coming year. Due to the elimination of driver costs, autonomous bus and taxi services could be offered at a much cheaper price. The introduction of these services is therefore likely to further reduce the incentives to own a car, especially in big Western cities. It is therefore expected that car ownership will progressively decrease in the longer term.

The market for personal mobility could transform dramatically over the next 25 years

Deloitte research based on data from the United States[2] suggests these changes could occur more quickly and at greater scale than many are prepared for, especially in densely populated areas. If shared and autonomous vehicles are adopted as quickly as other technologies (like cell phones, smartphones, and the internet), our modeling finds that significant change will begin within five years and that the market for personal mobility could transform dramatically over the next 25 years. Deloitte predicts that by 2030, shared vehicles could overtake personally-owned vehicles in urban areas. Shared driver-driven vehicles will likely grow quickly until 2030 but then lose market share to shared autonomous vehicles (see Figure 1)

In addition, total miles driven will likely increase by up to 25 percent until 2040, with shared mobility accounting for the vast majority of them (see Figure 2).

1. Source: "Urban Mobility System Upgrade: How shared self-driving cars could change city traffic," International Transport Forum of the OECD (2016). See: http://www.itf-oecd.org/sites/default/files/docs/15cpb_self-drivingcars.pdf
2. Source: "The future of mobility: What's next? Tomorrow's mobility ecosystem," Deloitte University Press (2016). https://dupress.deloitte.com/dup-us-en/focus/future-of-mobility/roadmap-for-future-of-urban-mobility.html, Written By: Scott Corwin, Nick Jameson, Derek M. Pankratz, Philipp Willigmann.

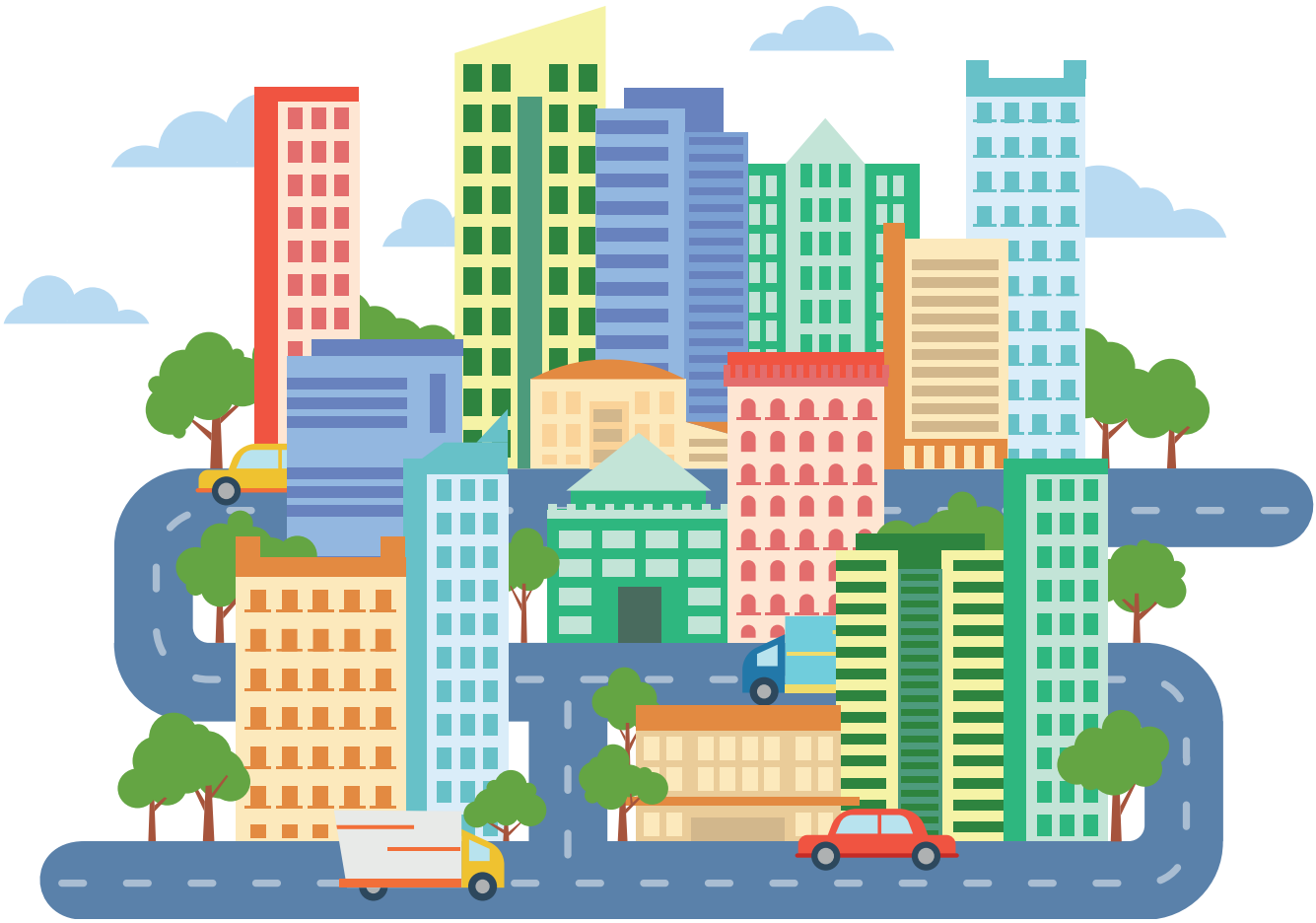


Figure 1 – Forecasts of new vehicle sales distribution in urban areas in the United States

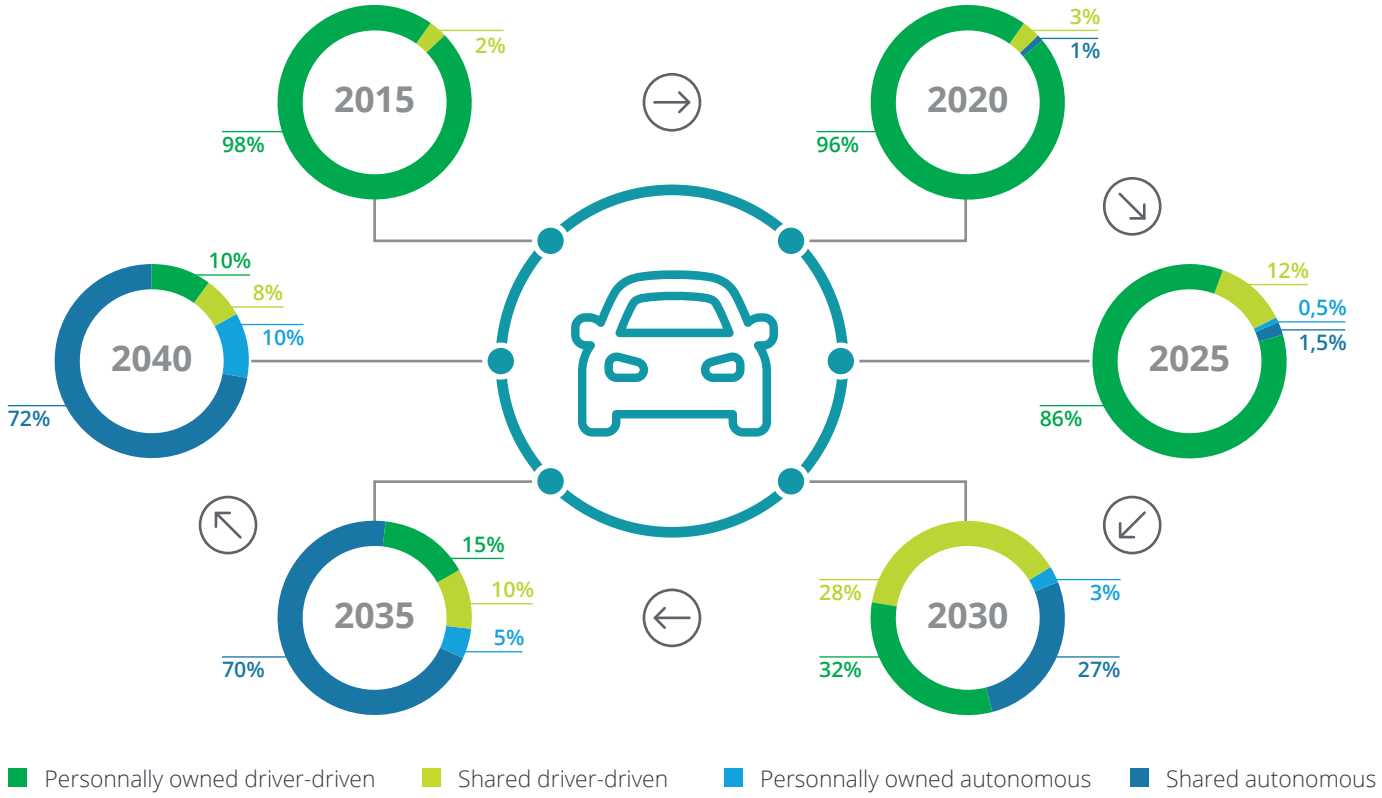
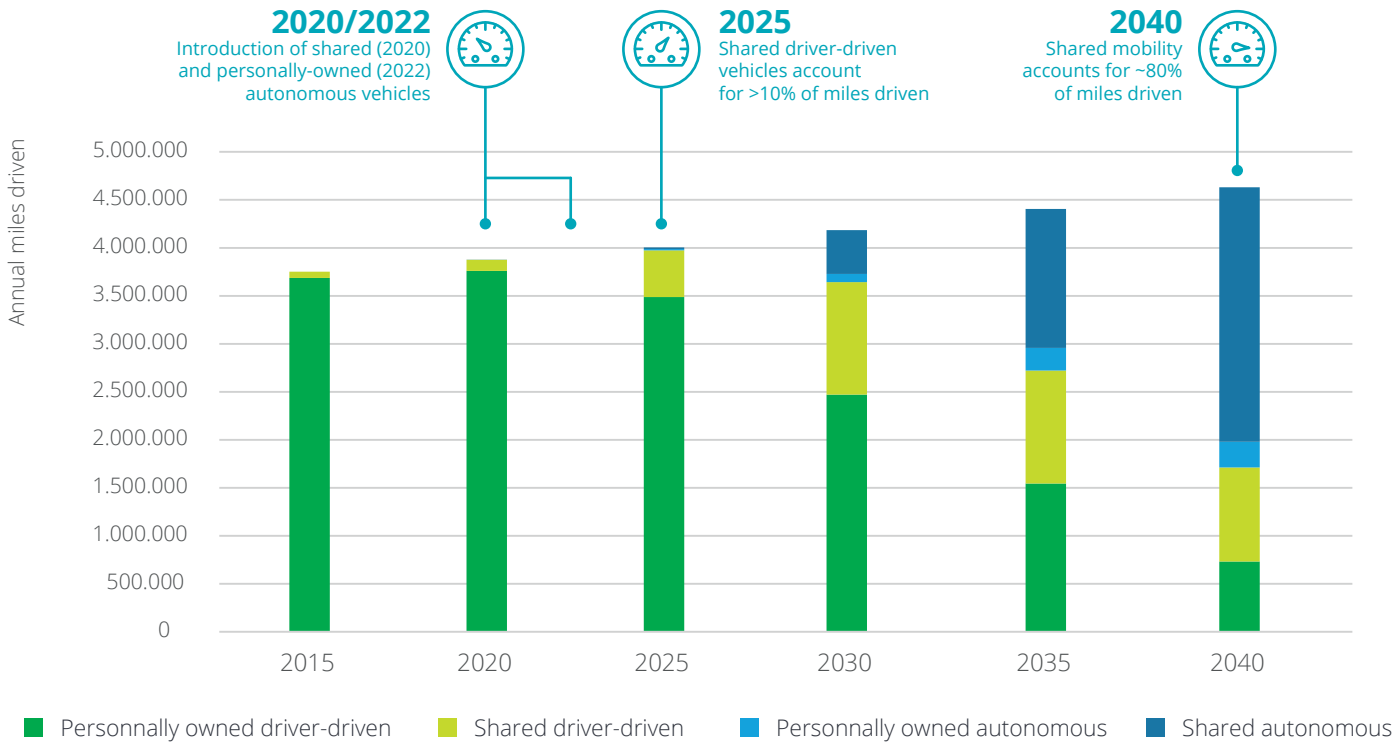


Figure 2 – Forecasts of total miles driven in the United States



A different city layout and policy is required

Decreasing car ownership and increasing reliance on shared or autonomous vehicles has large implications for city street layouts. Access roads to residential building blocks and offices will need to be redesigned to accommodate high volume pick-ups and drop-offs. In addition, parking capacity may well become redundant over time. An analysis by the OECD[3] suggests that fleets of self-driving cars will completely remove the need for on-street parking. As a result, valuable city space will become available, which generates new opportunities for alternative uses.
For the city of Lisbon, the model city of the OECD analysis, this amount is equivalent to nearly 20 percent of the curb-to-curb street space or 210 football fields.
This perspective forces developers and governments to apply an agile long-term development strategy. Scenario-thinking and building in flexibility are the key words here. As expanding parking capacity is still required in many urban areas at least in the short term, the trick is to design the garages in such a way that they can easily be transformed to suit new purposes, such as retail, in the long run.

Figure 3 – Parking capacity can be converted into new functions

Furthermore, the decreasing demand for parking has interesting policy implications as well. After all, municipalities generally require real estate developers to provide for a certain level of parking capacity, depending on the size of the building that is being developed. This requirement can significantly diminish a developer's return on investment, especially when the parking capacity needs to be realized underground. As an increasing share of inhabitants of large cities relies on public transport, cycling, and ride sharing, municipalities have started to rethink their policies.

Municipalities are experimenting with new policy instruments and pilot projects

Take parking permits for example: in many cities they have become valuable assets due to the waiting lists that municipalities have set up to regulate the demand for parking. As a result, most permit owners are unwilling to give up their permit even though they hardly use it. The Municipality of Amsterdam therefore started to provide incentives for them to do so. In addition, it is also looking at reducing the parking requirements for areas that are being (re)developed. Although it is not easy to change these types of regulations in the short term, there is a clear need to assess whether "old policy instruments" still make sense in today's rapidly-changing environment. We therefore expect many local governments to start experimenting with regulation changes while also inviting the private sector to provide solutions.
As an example, for a redevelopment project in the city of Rotterdam, an architectural firm collaborated with a construction firm and an automobile manufacturer in order to develop a new urban living concept. This included a car sharing service as a way of compensation for the limited parking capacity provided.

In addition to these experiments, we expect many trials and pilot projects in the coming years. In 2016, the Future Bus successfully ran between Schiphol and Haarlem, while other smaller autonomously driving vehicles have been tested elsewhere in the country. Continuation of these pilot projects have been announced. In addition, Nissan will demonstrate self-driving cars in London this month, being the first mass-market brand to launch semi-autonomous vehicles to the public

3. See Timmerhuis Rotterdam. Architectural firm OMA collaborated with construction firm Heijmans and automobile manufacturer BMW, see also: https://www.youtube.com/watch?v=LqCVfn7mwgw

in Europe. These trials should provide insight on the potential impact of shared and autonomous vehicles and result in a next step toward the introduction of commercial services.
This brings us to the last and perhaps most difficult and interesting question:

What are the implications for real estate prices and the importance of location?
According to the famous rule, there are three main factors that determine real estate prices: location, location, and location. Will this still be the case if perceived travel time is reduced due to an increased use of shared and autonomous cars? Will many people opt for a larger and cheaper house outside the city in these cases, thus reducing price differences between urban and rural areas?

Perhaps, but let's not forget that experts have underestimated the role of location before. Only 15 years ago, leading economists and urban planners predicted that the internet would revolutionize area development and real estate prices. As the internet drastically reduced the cost of communicating over distances, many of them argued that the importance of location would practically disappear. "The Dead of Distance" (Cairncross, 1997) and "The World is Flat" (Friedman, 2005) are illustrations of these theories.

Current insights show that the opposite has in fact happened. The low prices of connecting over long distances accelerated globalization. Yet instead of reducing the need to travel, the importance of location has only grown bigger because decision-making and innovation still largely takes place with face-to-face communication. In "Triumph of the City," Glaeser (2011) it was concluded that "the declining cost of connecting over long distances has only increased the returns to clustering close together." This largely explains the high real estate prices in, for example, the City of London or Silicon Valley.

As autonomous cars, unlike the internet, would enable people to attend meetings in person, while largely reducing the perceived travel costs, a flattening effect on real estate prices should not be stricken. However, it may be too early to see an impact on real estate prices, 2017 is set to be an exciting year for the development of the technology itself.

A large share of non-car users can be expected to switch to the use of shared and self-driving vehicles.