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IPSOS VIEWS

The Future of Mobility
On the road to driverless cars

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Introduction

Cars haven't changed too much over the last few decades, but the automotive industry is well on its way towards a new era.

The latest technology enables more relaxed driving on motorways or in dense city traffic, and assisted parking. Nevertheless, today's driver must still concentrate on the driving environment to remain safe.

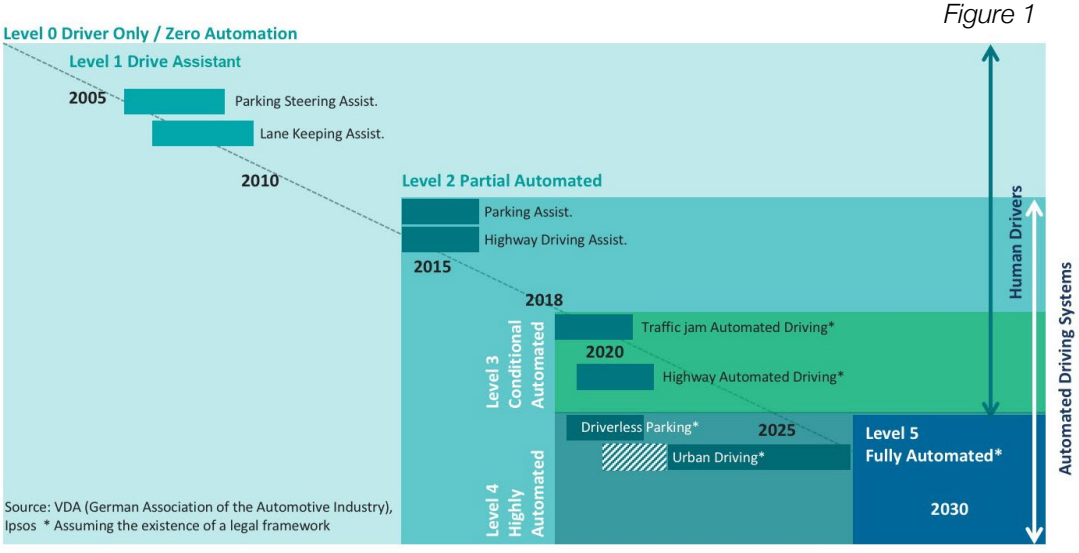
While some consumers still aren't truly *convinced* that driverless cars could be a reality soon, the industry has defined a clear roadmap towards fully automated driving (see ***Figure 1***) under all conditions with no humans needed inside the car. Highly Automated Cars aren't on the road yet, but it is predicted that such vehicles will be on the road within 5-10 years[1].

The key trends

'Disruptive driving' (driverless cars and connectivity), 'electrification' (battery electric vehicles) and 'shared mobility' (car sharing and ride hailing) are the three key trends which could reshape the whole automotive landscape. But how will consumers react towards all these concepts of future mobility?

In this article, we want to focus on disruptive driving. To start, we would therefore like to define 'disruptive' technology as technology which changes everything about the way in which something happens – and the removal of human control from vehicles is probably the biggest single change since the motor car replaced the horse and carriage.

Figure 1



1. The German Association of the Automotive Industry (VDA) published: "German manufacturers and suppliers are ready to facilitate vehicles with initial automated systems from 2018 onwards." Autonomous vehicles, with cars capable of driving themselves in all, or nearly all, situations predicted to first hit the market between 2021 and 2025 http://www.reuters.com/article/us-china-autos-autonomous-idUSKCN12Q0OZ

How accurate these predictions of driverless cars are remain to be seen. In the meantime, Ipsos has interviewed more than 130,000 car owners from nine countries to find out more about:

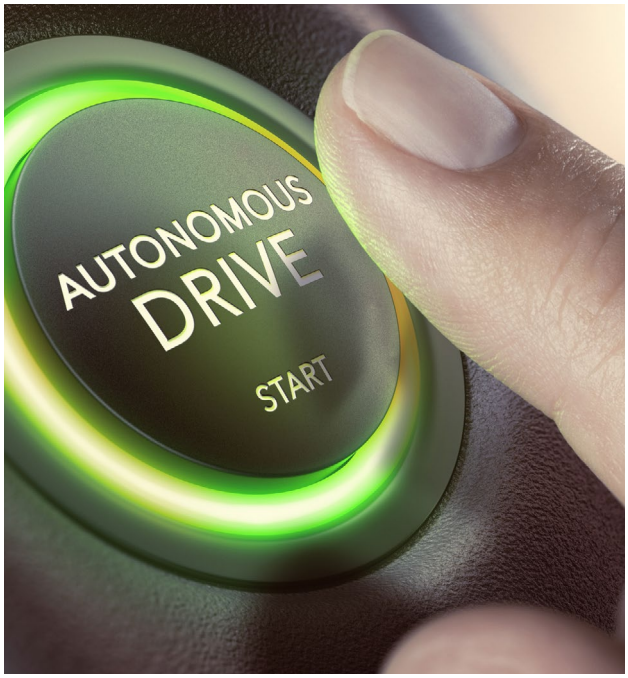
- attitudes to automated driving;
- how it could affect the vehicles;
- who is most likely to want it;
- who will be the most trusted technology provider; and
- concerns about the concept.

To measure the future success of new technologies and business models, we will need to **connect the key trends**. While electrification and shared mobility are not discussed here, we will soon see concepts arising that merge those trends into a single mobility concept. For example:

- battery powered self-driving micro buses, which will pick-up passengers individually after clicking a button on an app; and
- despite some driving enthusiasts having difficulties imagining '*Fahrvergnügen*' – enjoyment of driving – in self-driving vehicles, even privately owned passenger cars will be equipped with future mobility features which could make our life easier.

All these new trends and exciting model launches will slowly be recognised by consumers and their preferences will continuously change over the coming years.

"In this instance, a 'disruptive' technology is one which changes everything about the way in which something happens"

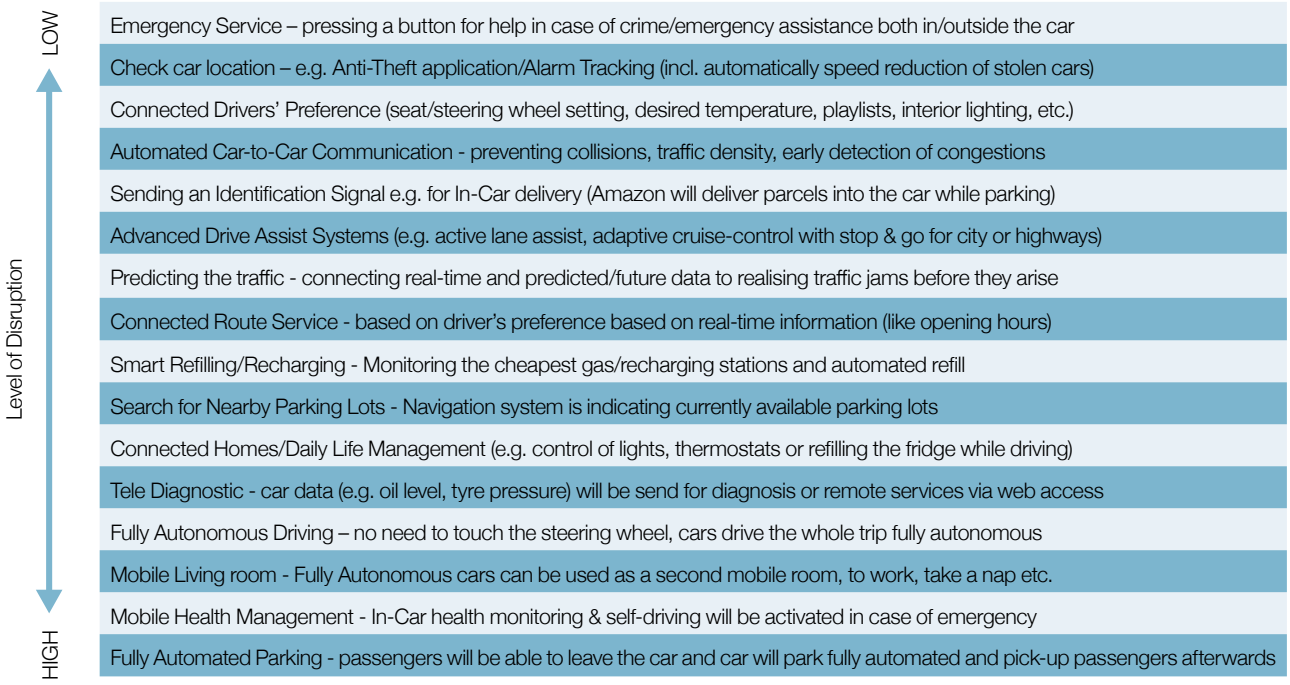


Disruptive driving

As part of the survey, we evaluated the interest and payment acceptance of some future mobility services. As illustrated in ***Figure 2***, these have been ranked by disruption levels, from a low level of disruption like an emergency button in the car, to a high level of disruption such as fully automatic parking, which allows the passenger to leave the car while the car parks by itself somewhere nearby. 'Fully Autonomous Driving' is just one of many potential services and features that disrupt current driving 'normality'.

We evaluated sixteen future car services (across different disruption levels) and found out that Fully Autonomous Driving (20%), Emergency Service (17%) and Traffic Prediction (10%) are considered to be the most important mobility features for the future.

Figure 2



Fully automated driving

The concept of the driverless car brings both questions and opportunities. Will it improve road safety and reduce the incidence of traffic jams and accidents? And while we're being driven around by this 'computer on wheels', will our cars become a mobile device in the 'Internet of things'?

Just the mere act of being driven will free up our time and opens the door to a whole new world of activities for car travel. In *Figure 3*, we can see by region how people envision spending an hour in a car in which they are being driven in a fully automated car.

Such a change in behaviour while travelling will most likely lead to very different interior concepts.

Traditional car interiors with two seats in the front and two or three in the back, all pointing towards the front, may soon be discarded as a concept. As there won't be any drivers, everyone in the vehicle will be a passenger and therefore can relax as passengers currently do.

In the future, front and rear seats could be folded into lying positions, or seats could be turnable by 360°, or combined into sofas. It's an exciting time for interior designers of cars, and customer understanding will be key in predicting the most successful concepts of the future.

Figure 3

Activities while driving fully automated

	Asia	America	Europe
Sleep / take a nap	10 min	6 min	5 min
Work, write mails and business communication	5 min	5 min	5 min
Communicate privately (directly or via phone/e-mail/messenger/video)	15 min	14 min	17 min
Relax by reading (books/online news feeds, etc.)	4 min	5 min	5 min
Relax by watching movies/videos/TV-series/playing games	8 min	6 min	5 min
Online shopping	2 min	2 min	1 min
Still pay attention to the road	16 min	22 min	22 min
		60 min	

Who is it for?

Younger consumers (below 35 years old) are more open and interested in new features such as connectivity and autonomous driving services, while older consumers (above 50 years old) are more reserved.

A second differentiation factor is the place of residence. Consumers living in smaller cities (rural and thinly populated areas) show a lower interest in future mobility services, while residents in mega and big cities are more interested.

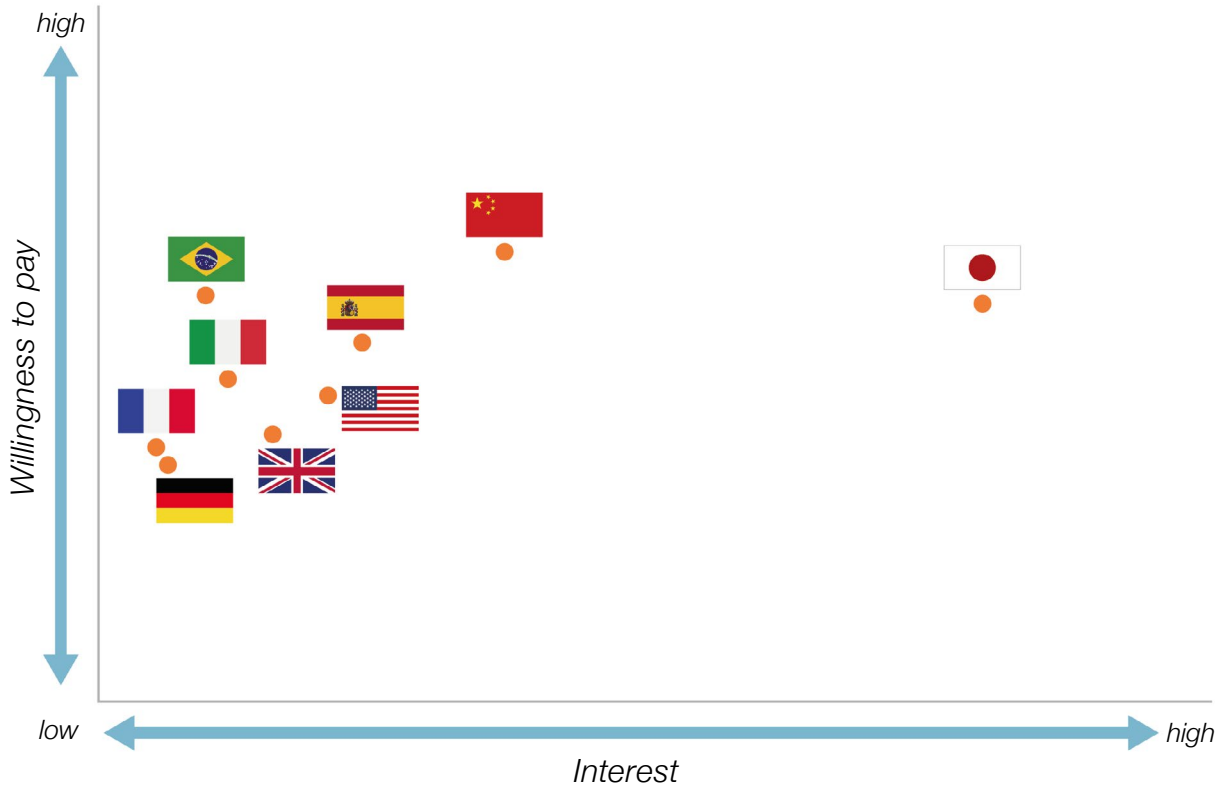
The key target group with the highest interest is therefore *young urban consumers*.

The mobility industry fully understands that technological developments are fundamental. On the other hand, new services and future features must be accepted by consumers and that is far more complicated than just focusing on these young urban consumers.

Fully Autonomous Driving

(normalised per country, differences to average displayed)

Figure 4



For these mobility providers, it is essential to have a precise understanding of the various vehicle segments (by size and body types, makes and brand categories), as well as the relevant regions.

Interest differs a lot by region. Across the globe, fully automated driving functions are perceived as the most interesting development.

The survey data implies that self-driving cars will be welcomed in Asia (especially in Japan), while consumers in Northern Europe (particularly those in France and Germany) remain very critical towards this new technology.

While ***Figure 4*** appears to show that the Japanese overall would be more interested in fully automated driving features, this doesn't show the whole picture, as interest and acceptance varies a lot by service.

As we saw in Figure 3, Asian consumers seem to trust self-driving cars the most, as reflected in their plans to nap for 10 minutes in an hour-long journey – nearly twice as long as their European and American compatriots.

The global development of future mobility will always need to take local needs and requirements into account.

Concerns

If consumers assume that their car in 2023 would have fully automated driving functions, which they could switch on and off as they like, less than 15% anticipate always using this function. More than a third intend to not use self-driving functions at all.

The highest predicted refusal of driving fully automated is recorded in Germany, France and the UK, where we see a lack of interest from 45-50% of people. This high refusal rate could be driven by a distrust in new technology, which is reflected in the wish to continuously pay full attention to the traffic – an understandable position given the current situation.

But even if we assume that the distrust in self-driving technologies will dissipate the longer they have been successfully proven in the market, there will still be various barriers, which the industry needs to overcome.

One of these will likely be the concerns about *data protection* and *privacy*.

Governments, authorities and vehicle producers are discussing regulations for how long the route-tracking information will be stored inside the automotive 'black box'. Some consumers see the access and storage of 'their' individual movement patterns quite critical. In almost all countries, there is a high concern (from 40-60%) regarding such data security issues.

Concerned consumers are significantly less interested in self-driving cars than consumers who don't see privacy issues. A quarter of consumers (26%), with low or no privacy concerns, rate fully autonomous driving functions as the most preferred (top 3) future mobility feature. However, 17% of consumers who are afraid to give access to their movement data, are significantly less interested in self-driving cars.

Besides the human dislike of sharing too much personal data, there are other barriers, such as the incidence of car sickness when not paying close attention to the road.

There are many technical questions the engineers are currently trying to solve, and there will be many more questions related to consumer understanding which need to be explored more deeply over the coming years.

Who will provide the future of mobility?

It is not only the traditional car industry that is working to reshape the future of mobility. Completely new players are pushing their way into this field, and thus there are serious worries about being the next Nokia. Will car producers die out? Will OEMs fade from emotional brands to unbranded component suppliers? Or will they be able to steer the future of mobility themselves?

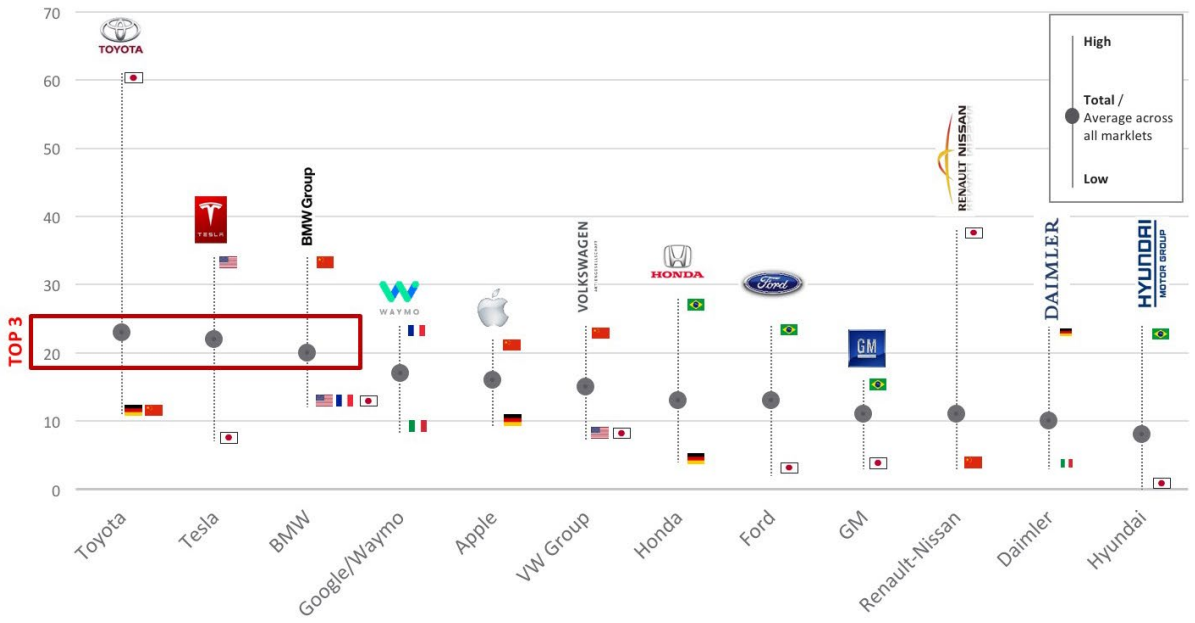
Google, Apple and Samsung are examples of technology companies that might agree that cars are the ultimate mobile device. In addition to the tech companies who are engaging with their own mobility projects, there are tech suppliers, like Intel-Mobileye, NVIDIA and Microsoft who are in close cooperation with the traditional vehicle industry in supporting autonomous driving and other cloud-based services. The traditional automotive suppliers, like BOSCH, Delphi or ZF, on the other hand, are fully involved in the roadmap towards future mobility.

Beside car producers and tech companies, many other industry sectors are active in the space of future mobility. Public transport providers, energy companies, car rental, car sharing and ride sharing companies are all fighting for their share of this fast-growing market.

It's not the case that most consumers believe that the emerging western car manufacturers, who were founded in the 21st century, such as Tesla, will necessarily be trusted most. While two out of ten consumers in global key markets do trust companies like Tesla, almost 80%

Figure 5

Leader in Autonomous Driving



of consumers still see traditional car manufacturers who have a long history, as the trusted leaders of future mobility.

However, when asking consumers explicitly which company they consider as leader in autonomous driving, we receive interesting insights (***Figure 5***). While Toyota (23%), Tesla (22%) and BMW (20%) are viewed as being the three leading players in the realm of self-driving cars, they are followed by the two large tech companies Google (17%) Apple (16%), before other large traditional OEMs like the Volkswagen-Group (15%). Of course, this ranking does not match the real level of leadership in autonomous technologies, as experts might see it, but this is the reality on how consumers rank the competition in the field of self-driving cars globally.

And perhaps it's not surprising, that consumer perception varies greatly by country. While Japanese consumers are fully convinced that their Japanese OEMs are leading the way (Toyota 61%, Nissan 38%, Honda 21%), a large amount of Germans believe that the German car industry must be the leader in self-driving cars, and French consumers show a significant higher trust for their French car industry.

Conclusion

It will be interesting to see how these perceptions change over time. On a quarterly basis, we will monitor which companies are perceived leaders in the area of autonomous driving. We will also track how the interest towards connectivity and self-driving functions will evolve. Will the trust in these new technologies increase as soon as consumers experience self-driving functions on their own? How will the upcoming model launches and accompanying communication influence the consumer acceptance? And how will the new trends impact interest in owning a car?

Future mobility has a big aim: the democratisation of mobility. Soon, the elderly may be able to maintain their mobility, even when poor eyesight may not allow traditional driving. The blind will also be able to enjoy spontaneous trips without any support needed and even secure end-to-end children transportation services might appear. Not only will driving licences be redundant for passive riders, but self-driving will have many other implications, the scope of which we can barely begin to fathom.

We are on the edge of a new mobility era and total customer understanding will be key in making this a success.

Method: In wave 1 Ipsos interviewed more than 130,000 car owners across nine countries, in the Americas (USA, Brazil), in Europe (France, Germany, UK, Italy and Spain) as well in Asia (China and Japan). Interviews were conducted online in January and analysed in April and May 2017. All results are weighted by net population and size of car parks.

This paper is the first in a series of three on future mobility.

For more information on this survey, please contact FutureMobility@ipsos.com

IPSOS VIEWS

The Future of Mobility

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