Telefónica

Connected Car Industry Report 2014_

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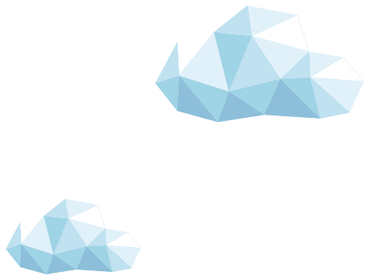

Foreword Telefónica_

This is the second report from Telefónica on the connected car industry. Last year's report outlined the opportunities and challenges facing the connected car market. It found that the connected car will achieve mass-market penetration in the next few years: the overall number of vehicles with built-in connectivity will increase from 10% of the overall market today to 90% by 2020.

This year we have conducted opinion research in Brazil, Germany, Spain, the UK, and the US, to find out what drivers think about - and what they want from - connected cars. The research has revealed some fascinating insights on levels of demand for connected cars, and what connected services drivers value the most.

Connected cars are set to revolutionise the car as we know it. Drivers will be able to check the performance and health of their vehicle in real time. They'll be able to instantly diagnose their vehicle, shifting the balance of power from the car mechanic to the consumer. Remote access to their car via their smartphone or tablet will improve security by notifying them if it has moved unexpectedly.

Connectivity will also usher in a new era of in-car infotainment, letting people seamlessly access entertainment and information services they know and love as part of the driving experience.

Bringing the power of connectivity to the car offers significant opportunities for the consumer, the automotive industry and the mobile industry alike, ranging from increased safety and security to the introduction of innovative new services. But building this industry will not be straightforward. The connected car market is at an early stage and there is some uncertainty about the future.

We want to help car manufacturers grow the market, and help them provide drivers with the best possible connected car experience. Which is why we commissioned the Connected Car Report last year which explored industry perspectives on the future of the connected car; and why we have undertaken research this year into what drivers really want from the connected car.

For us the connected car is no longer just a concept, but a reality. We have the platforms, the partnerships, and the industry insight to help car manufacturers seize the opportunity.

We know that global scale is key so we have taken the lead in forming a global M2M alliance which to date comprises eight leading mobile operators; KPN, NTT DOCOMO, Rogers Communications, SingTel, Telefónica, Telstra, VimpelCom and Etisalat. This alliance was formed to bring the technology to market that will simplify the process of global M2M deployments.

We are also at the forefront of developments in services like fleet management, for instance partnering with Sascar to develop fleet management solutions for light vehicles in Brazil. And earlier this year Telefónica was selected by Telsa to provide connectivity to its award winning Model S across multiple countries in Europe, including Germany and the UK.

In addition, Telefónica has invested in the insurance telematics market, launching a pioneering motor insurance policy with European insurance company Generali Seguros, which calculates the premium according to driving habits.

Through all of this, we can deliver the unique global insight and experience needed to help grow the Connected Car market.

Surya Mendonca, Telefónica Global M2M MD

"We want to help car manufacturers grow the market, and help them provide drivers with the best possible connected car experience"

i Find out more about the future of the connected car with our exclusive video featuring interviews with some of the industry's leading names - bit.ly/cc-tef

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Henry Bzeih, Kia Motors America

Henry is Chief Technologist and Head of Connected Car at Kia Motors America. He is responsible for heading Kia's US operations for infotainment product planning and connected car division. Prior to joining Kia, Henry held many critical R&D positions in the auto industry covering all elements of Automotive EE.

Greg Ross, GM

Greg serves as Director of Product Strategy and Infotainment for GM's Global Connected Consumer group, where he is responsible for leading the implementation of GM's infotainment product line-up in GM vehicles. Previously, Ross was director of business extensions for OnStar, leading efforts to develop new business ventures, which build on OnStar's strong brand and well-established reputation for customer service.

Nicolas Nollet, Renault

Nicolas has worked at Renault for 14 years, most recently as Vice President of Sales & Marketing Strategy at Renault. Prior to that he held roles with JCDecaux and Peugeot Citroen.

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Contributor biographies

Massimo Cavazzini, Fiat Chrysler Group

Massimo joined Fiat Chrysler Group Automobiles in 2011 as Infotainment product planner and global lead for FIAT eco:Drive, becoming head of Connected Car EMEA in 2013 at Uconnect, Fiat Chrysler Group. Prior to that, Massimo helped two old-media companies in the digital transition, acting as Chief Digital Officer, before joining 3 Italia, a Hutchison Whampoa Company, in 2005 where he spent six years in different marketing, communication and sales roles.

Ben Auslander, Volkswagen of America

Ben is the Business and Content Manager for Volkswagen of America. In this role Ben is responsible for future connected vehicle business models, strategies, and features for the US market. Before joining Volkswagen, Ben spent 13 years working for General Motors and OnStar. His experience includes various supply chain roles in procurement, supplier development, and new product launch. Ben also worked in business expansion and sales roles for OnStar as a Business Development Manager and North East Regional Sales Manager, analysing and prioritising new region expansion, other auto companies, retail product launch, and regional sales performance.

Ian Digman, Nissan

Ian Digman has worked in the automotive industry for 18 years. Through his career, spanning Nissan and Ford, he has held many product management and planning roles across various car segments in Europe and Asia. Originating from the north of England, he was educated as an automotive engineer at Loughborough University, UK and received an Executive MBA from Duke University, USA.

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John Ellis, Ford Motor Company

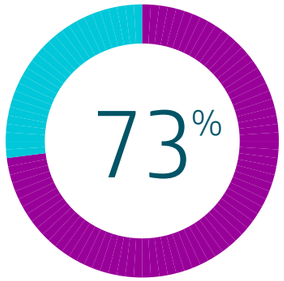
As Global Technologist and Head of the Ford Developer Program with Ford Motor Company, John is tasked with expanding Ford's "brought-in" strategy of integrating mobile technology into the vehicle. During most of his career, John worked for Motorola where he held key leadership positions in engineering; product management; software & services; marketing and strategy. While there, John participated in developing, marketing and selling Motorola's mobile software and services, their software developer ecosystem, and industry-leading Open Source Software program.

Pavan Mathew, Telefónica

Pavan Mathew is the Global Head of Connected Car at Telefónica, and a 15 year veteran of the automotive and telematics industry. Prior to Telefonica, Pavan held senior level positions in engineering, marketing and business development with General Motors and OnStar. He holds a B.S in Mechanical Engineering, M.S in Engineering Management and an MBA from the University of Michigan's Ross School of Business.

Executive Summary_

The connected car market will achieve mass-market penetration in the next few years: the overall number of vehicles with built-in connectivity will increase from 10% of the overall market today to 90% by 2020.



Almost three-quarters (73%) of drivers considered safety and diagnostic features as the most important

Our research shows that consumer awareness of connected car products and services is high and is now influencing purchasing decisions. 71% of drivers are interested in using or are already using connected car services. And 80% of drivers now agree that cars will soon have a similar level of connectivity and services to their smartphone device.

Drivers have a clear idea of the services they would like to see in their next car. Almost three-quarters (73%) of drivers considered safety and diagnostic features as the most important, with many indicating that they would particularly like to be able to access vehicle diagnostics from their smartphone. Drivers are also interested in navigation services that have greater functionality than today's satnav systems such as live traffic updates.

The research found that there is a high degree of interest among drivers for features that will help reduce the cost of running and maintaining a car. In fact when asked which features would be most important when buying a new car, fuel efficiency was the top preference across all countries.

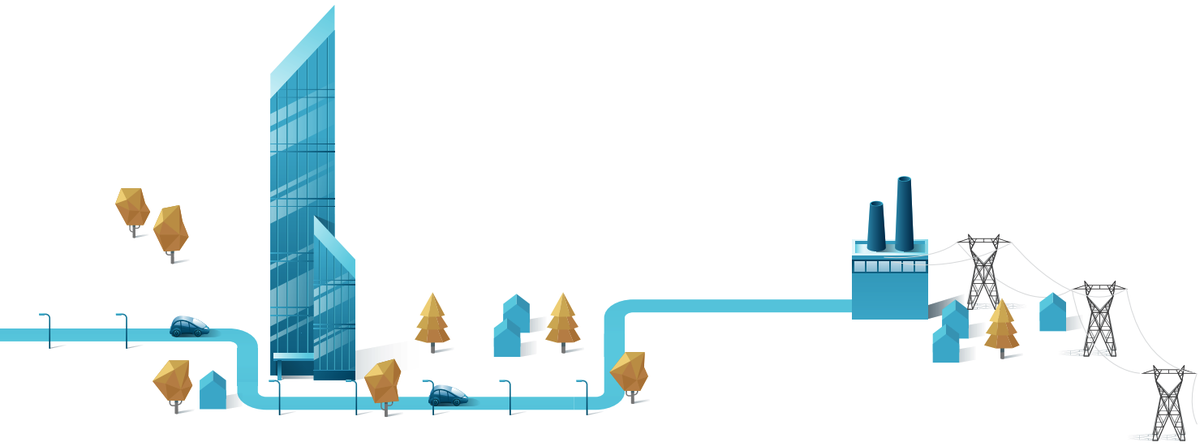
And more than 40% of drivers in each of the countries surveyed consider usage based insurance policies to be a desirable feature in a connected car, this being highest in the UK at 53%.

The dashboard is the favoured way for accessing connected services, particularly for safety, navigation and vehicle diagnostics, with more than 60% of drivers across all markets preferring to access features in this way.

Car ownership is declining in many developed economies as millennials embrace alternative options. Our survey found that on average 35% of consumers expected not to own their own car by 2034, and instead predicted they would be using alternative options such as car sharing schemes.

Drivers in different countries will prefer to pay for connected services in different ways. Most Spanish drivers would prefer a one-off payment (49%) while those in America, Germany and the UK would favour basic connectivity with the option to choose additional services. Brazilians are split between the latter and a full-on PAYG model, suggesting a degree of flexibility not seen in other countries.

We may still just be on the starting line, but connected cars will become mainstream in the next 3 to 5 years, as a result of a combination of consumer demand, vehicle safety legislation such as e-Call, the wider deployment of high speed mobile networks, and increased interest from technology companies outside of the automotive industry.



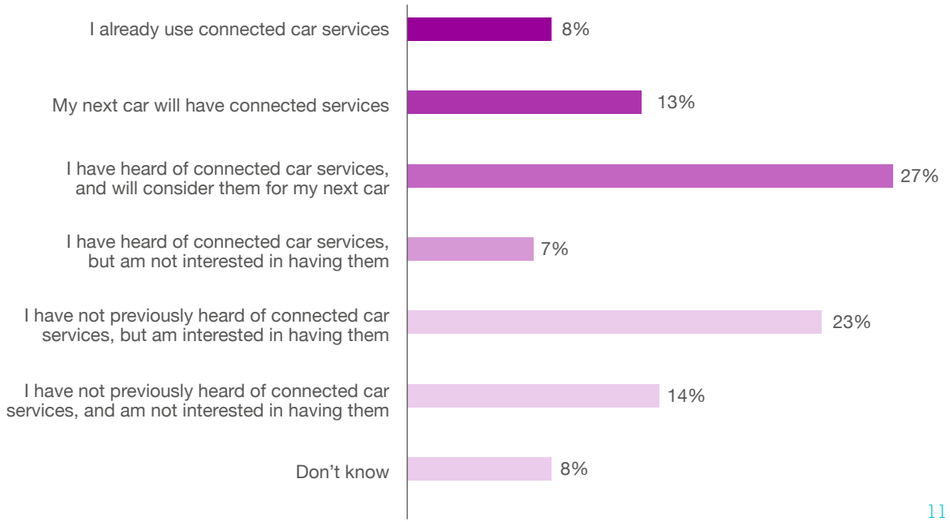
Global demand for the connected car_

This year's Consumer Electronics Show in Las Vegas trade show was dominated by OEMs and big tech brands alike showing off their connected car wares, leading to a general media consensus that the connected car was "here". But the question is, are consumers ready?

According to our research, they are. Respondents showed that there is sufficient global demand for connected car services, with 71% of drivers interested in using or are already using connected car services.

Not only is demand high, but 80% of interviewees expect the connected car of the future to provide the same connected experience they are used to at home, at work and on the move via their mobile phone. Consumers today expect connectivity as a given wherever they are and the car is no exception. However, the automotive environment is unique and provides new challenges for connected services.

Levels of interest and awareness in connected car services



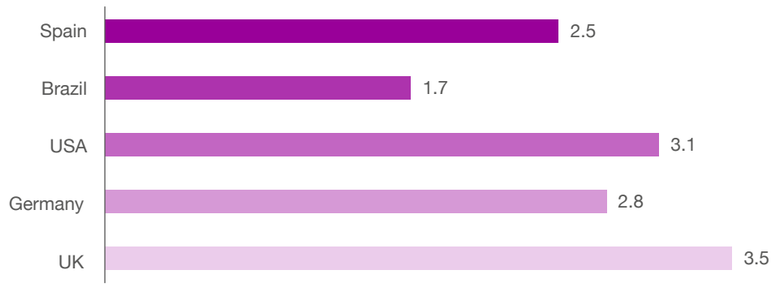
"Despite the high demand for connectivity in cars, vehicle ownership cycles pose a challenge to higher penetration of connected vehicle"

User experience

The environment of the car means providing the optimal user experience is critical, as any connected services introduced must take into account the behaviour of drivers and passengers. Three-quarters of the time a car is driven, it is being done so by a single person on the way to or from work. This isn't the optimal environment for visual media consumption; other forms of media are more relevant such as Pandora or Spotify. Access to these kinds of services should be seamlessly integrated in the connected vehicle. For instance, the playlist created on your home tablet can be automatically synced to your in-car entertainment system, controlled through voice and gesture controls. Spotify in fact has already signed deals with both Volvo and Ford.

Despite the high demand for connectivity in cars, vehicle ownership cycles pose a challenge to higher penetration of connected vehicles, with our survey finding significant variations. UK and US consumers expected the longest lag before they acquire their next car, 3.5 and 3.1 years respectively, with Brazil the shortest at 1.7 years.

Years until next car acquisition



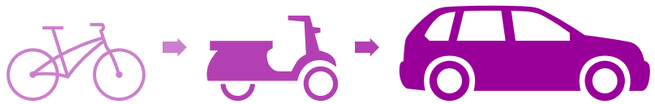
Connected Car Industry Report 2014
01 - Global demand for the connected car

To own or not to own

But this all assumes that people actually want to own a car. Currently, the UK has the lowest proportion of car ownership at 83%, with the US (94%) and Spain (92%) the highest. Our survey went on to find that on average **35% of consumers expected not to own their own car by 2034**, and instead predicted they would be using alternative options such as car sharing services. A report from Navigant Research predicted that global membership of car sharing schemes will rocket from 2.3 million in 2013 to more than 12 million by 2020. When it comes to the Millennial generation, this trend is magnified, with 53% of 18-34 year olds interested in participating in a car sharing service.

This fits with the wider trends, as the rise of the sharing economy takes hold in developed countries. However, it's important to note that OEMs are actually increasing overall global capacity. Sales volumes may be shrinking in Europe and in North America, but they're increasing in markets like Southeast Asia, North Africa, South Africa and South America.

35% of consumers expected not to own their own car by 2034, and instead predicted they would be using alternative options



In developing markets the consumers are moving from bicycles and motorcycles to cars, providing growth to the overall industry. Car sharing can be viewed as an opportunity from a connectivity standpoint. Schemes like OnStar and RelayRides allow consumers to rent out their private vehicles when they're not being used via an easy to use smartphone app. After the home, the car is the most expensive purchase for most consumers, and these types of services give the consumer an opportunity to reduce the cost of vehicle ownership.

As markets continue to mature, we will see more of these schemes emerging.

So where does this leave us? While there exists a growing appetite among consumers for connected vehicles, there is little indication that 2014 will be the tipping point for the technology. We can expect to see a gradual creep of connectivity into vehicles over the next few years, as opposed to an explosion over the next 12 months. The reason for this lies in the complexity of the challenges that connectivity is trying to address.

Expert insight

"Consumers are aware of connected cars and it is now becoming a key communication point for Nissan to reinforce the Innovation that Excites branding. The consumer understands the concept very quickly because of their exposure to consumer electronics. We are seeing a drive from consumers to have the same level of connectivity in the car that they would have whilst walking down the street, whilst sat in their front room, whilst sat on public transport. So just because they are spending two or three hours a day in a car, they don't want to be disconnected from their normal life. Young buyers are certainly now looking at the expense of cars versus their income. They're looking at the urbanisation of society and questioning whether owning a car is the right thing to do. But at the same time, at the other end of the demographic we're making cars a lot safer. When in the past somebody who reached 60 would consider handing their keys back, we're now providing a safer environment for that driver so they potentially keep being a consumer for longer."
Ian Digman, Nissan

"I think we still have some way to go to convince customers today about connected services and the value that they can bring to their lives. This is true across both the B2B and B2C segments. In the latter, the challenge is to educate the consumer about the value connected vehicles can bring above and beyond their smartphone. There's also confusion around how these services will be paid for. We're beginning to see our customers prepared to pay for some connected services via a yearly subscription, such as navigation in particular. However, there is also a growing demand for pay-as-you-go services that allow drivers the flexibility to add or remove services as they need them. Family holidays are a good example, where some services may only be needed for a few weeks at a time."
Nicolas Nollet, Renault

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01 - Global demand for the Connected Car

"In future there will be a shift between selling a vehicle to selling mobility services"

"I believe that car sharing is an opportunity, especially within the growing trend for mega cities. In these enormous urban centres one will always need a car and will always need services. These services will need new technologies, maybe NFC to open doors for example, many of which are being developed by OEMs as part of their connected car offerings. In future there will be a shift between selling a vehicle to selling mobility services. This won't happen soon, but in the mid- to long-term the industry will probably move towards providing mobility services rather than selling a single vehicle to an individual."
Massimo Cavazzini, Fiat Chrysler Group

"We see some growth in alternative services like car sharing, particularly in trend analysis and in consumer insights around the growth of mega cities. There's a lot of places where cars are discouraged or more difficult to own in some of the larger cities in the world. So there is an incentive to find new, alternative and more innovative models for personal transportation. I think we still see a strong interest in personal transportation and a desire to have it when needed but I think there is an interest in making it possible to pursue different models. I think connectivity is a major component of that expectation. When customers are connected and cars are connected you have a much greater ability to create services because you'll want to be able to interact with the car remotely to do things like locate it, unlock it, or arrange to share it with somebody else. So having a car that is capable of communication with the Internet and with consumers is an important component of that vision."
Greg Ross, GM

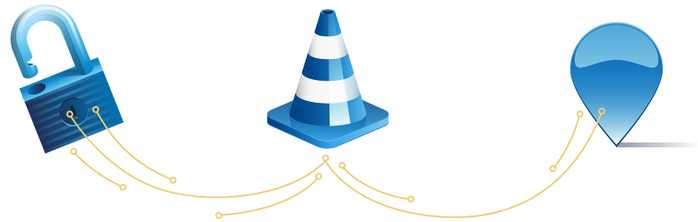
"Ford has robust forecasts for car demand. We are very much focused on the BRIC nations where there's an emerging economy and an emerging world. We're very bullish about the opportunities there, particularly around light, medium and heavy duty trucks. We publicly put billions of dollars of investment into China, for example. The US and Western Europe have exported movies for the last 70 years where cars predominantly represent freedom and arriving at a certain status in life. Consumers in key countries like India, China and Southern Latin America are now increasingly in a position to enjoy this as well. The marketplace is becoming more and more aware of what cars can and can't do, and we're responding to that in ways that engage with our customers."
John Ellis, Ford

What services are most in demand?_

We have seen that there is sufficient global demand to sustain the connected car industry across key markets such as Germany, UK, Brazil, Spain and the USA. Although the industry has some hurdles to overcome to reach critical mass in the next few years, it is clear that a significant number of consumers are expecting connectivity in their vehicles. But what exactly do people want from their connected car, and what services are most in demand?

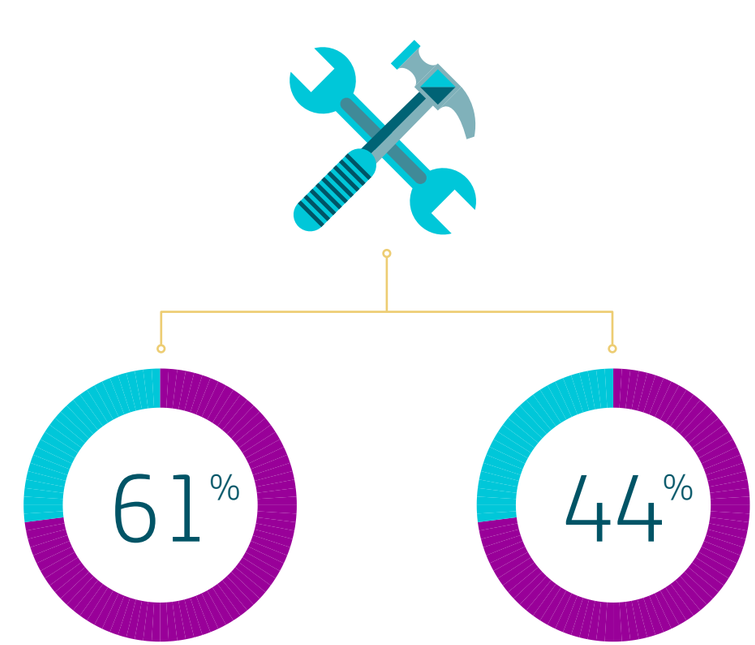
Demand for safety services

Across all the markets we surveyed, there was clear consensus about the three features most in demand: increased safety, early warning systems (vehicle diagnostics) and smarter navigation. Indeed, almost three-quarters (73%) of respondents chose safety and diagnostics features as the most important, giving a clear indication of the areas they would expect connected services to focus in the future. For instance the survey found a very strong appetite among consumers to be able to use their phone or tablet to be able to check their car's condition before setting off on a long journey. More than 60% of drivers agreed they would like to have this peace of mind.



This is a good example of how connectivity can empower people, letting them take more control of their car and the driving environment. 61% of drivers agreed that connectivity would give them more control by being able to understand when the car had a problem. And almost a half (44%) of drivers believed such technology would help reassure them a mechanic was quoting a correct price for repairs.

Reassuring and empowering drivers



of drivers agreed that connectivity would give them more control by being able to understand when the car had a problem.

of drivers believed such technology would help reassure them a mechanic was quoting a correct price for repairs.

The promise of cost savings and added value will significantly help to drive adoption of a new technology. For far too long, the mechanics of a car have been seen as too complex for anyone but expensive specialists to understand. Diagnostic information presented in an easy to understand way will tell drivers exactly what is wrong with their cars, and equip them with the information they need to be able to shop around for the best price for a repair.

These results are very consistent with research from OEMs and the wider market. Consumers currently tend to think of connected services in terms of WiFi and infotainment, but often this changes when they are made aware of the sheer variety of options that the technology can offer. In fact, it almost always comes back to safety and diagnostics, proving again just how important factors road safety and vehicle maintenance are in consumer purchasing decisions.

According to research from the GSMA, safety and security applications, such as eCall systems that alert the emergency services in the event of an accident, will be the most common services supported by connected cars, shipping in 41.7 million vehicles in 2018, up from 7 million in 2012.

While the practicalities of safety and trouble-shooting were the most immediate interests of our survey respondents, opinions around what would prompt consumers to purchase one vehicle over another were markedly different. In fact, when buying a new car, almost 50% of people think that in-built connectivity and the ability to plug in a smartphone (tethering) are two of the most important features influencing their decision. Most new vehicles today, even with reduced options, will have a basic level of connectivity in some form, even if it is as simple as Bluetooth integration with a smart device.

"Consumers currently tend to think of connected services in terms of WiFi and infotainment, but often this changes when they are made aware of the sheer variety of options"

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Fuel efficiency benefits

Beyond connectivity, fuel efficiency emerged as another important feature in car buying decisions for every market in our survey. Fuel efficiency was the top preference across all countries. As fuel prices continue to rise and consumer awareness around climate impact increases, this feature will only become more important and connectivity in cars will play a key role in helping manufacturers meet and surpass customer expectations.

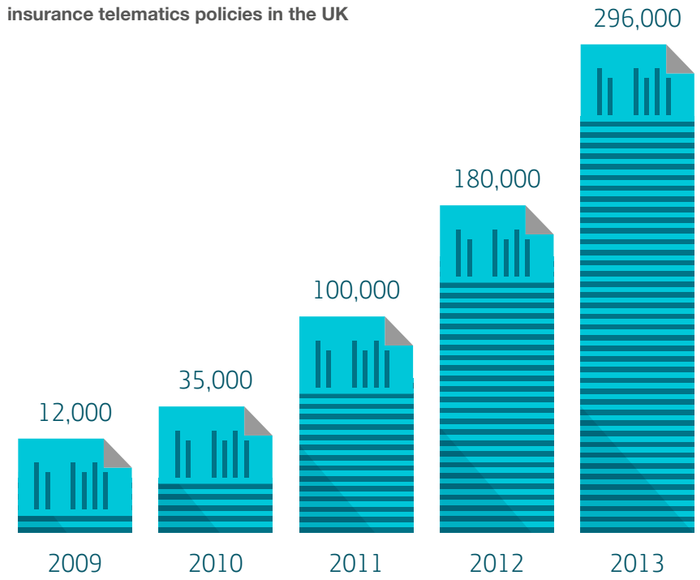
Drivers have been able to view their "miles per gallon" for many years, but with connectivity the feedback is dramatically improved. Drivers can arrive at a destination and their vehicle will tell them exactly how much fuel they have used and how much the journey cost them. More than that, the vehicle can then start offering advice about how to lower that fuel consumption via a change in driving habits, be that lower speed or less braking. This is a wholesale move from one, infrequent data point to real-time, actionable feedback and another powerful way for consumers to take control of their vehicle to make driving cheaper.

An insurance revolution

The survey also highlights other significant car market trends. For example, connected services have led to a rise in popularity of usage-based insurance services, also known as black box insurance. They are particularly popular in the UK, with 53% of drivers saying it is one of the connected car features they would be most interested in, reflecting the insurance industry investment and marketing around this feature that has many predicting it will become a mainstream form of insurance across Europe. The British Insurance Brokers' Association has released research finding that behaviour-based car insurance sales have increased over 61% since June 2012, policies that can offer consumers savings of up to 25%.

Connected Car Industry Report 2014
02 - What services are most in demand?

Number of behaviour based motor insurance telematics policies in the UK



Source: British Insurance Brokers' Association, 2014

Social media a minor player

Our survey indicates that drivers in different countries have different expectations and requirements for connected car services. For instance in Brazil, **30% of people were interested in access to social media**, compared to just 9% in the UK. This is surprising, given the widespread popularity of social media on smartphones. Drivers may be reluctant to have their car's movements shared via social media but many will still want to access and update their status in social media.

OEMs are going to have to ensure that the range of connected cars they develop contain enough customisation options to account for the specific needs of different markets. But, as we will see, the good news is that manufacturers have a strong base to build from. Across the board, our survey found that consumers trusted OEMs to play a key role in the future of the connected car, from safety and navigation services to infotainment services.

"Having your car connected to emergency services and infrastructure has an incremental value"

Expert insight

"While the embedded modem is connecting the car to the internet, the smartphone is connecting the driver to the internet and then the car to the driver. So it's not a continuous connection. What we are seeing is that the mobile connection could be used for high bandwidth services like internet radio, while the embedded connection will provide more automotive grade and core services to the car such as telemetry, safety, security, anything related to the car that needs high reliability."
Massimo Cavazzini, Fiat Chrysler Group

"I see a huge expansion beyond legacy telematics such as vehicle health reports, safety and security, crash notifications into active safety and automated driving aspects. I also think vehicle-to-vehicle communication is going to grow very quickly in the next five years. The beauty of that technology is that the communication protocol can be used for a host of other services beyond vehicle communication, so it benefits the wider infrastructure too."
Henry Bzeih, Kia Motors

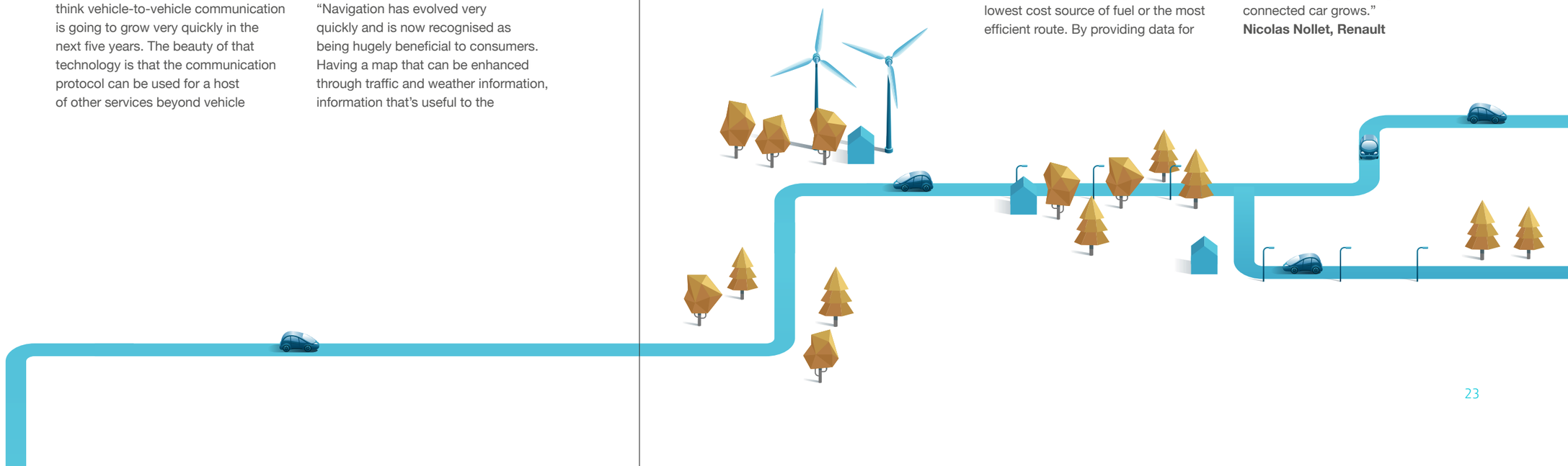
"What you see from a lot of our competitors is a multi-directional strategy, trying to cover as many bases as possible from the outset. For us we've focused instead in the short-term on getting an OCU [operator control unit] built into the car, which was a tremendous technological feat. From this we are currently leveraging safety services mostly, based on this embedded phone module. Other exciting services are coming through as well such as being able to use your mobile phone to unlock the door and some really innovative geo-fencing capabilities."
Ben Auslander, VW

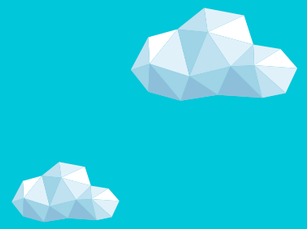
"Navigation has evolved very quickly and is now recognised as being hugely beneficial to consumers. Having a map that can be enhanced through traffic and weather information, information that's useful to the driving experience, is the next level. Connected safety hasn't necessarily been a purchase decision to date but is certainly becoming more relevant. However, when eCall kicks in across Europe I think consumers will understand the benefit more of how having your car connected to emergency services and infrastructure has an incremental value."
Ian Digman, Nissan

"The vehicle is going to become a smart cog in the wider Internet of Things"

"For us it comes down to the things that make the car a better vehicle. When we talk to customers about connectivity they say well it's a car and so what I need it to do are the things I bought a car for. They want it to be safer, more intelligent and more economical. Connectivity is a chance for OEMs to look at how we can help to reduce costs for customers and make cost of ownership lower by giving advice on how to drive more fuel efficiently, or helping you find the lowest cost source of fuel or the most efficient route. By providing data for things like usage based insurance or pay as you drive insurance, can I save you money on insurance?"
Greg Ross, GM

"Our customers are demanding two key services at the moment - navigation and safety. Live traffic information and updates about hazards such as speed traps are extremely popular, and we're seeing a growing appetite, as well as a willingness to pay for them. Western markets are also keen on safety services in particular, but we don't always see similar demand in other markets. On the B2B side we're seeing a demand around fleet and operation optimisation as companies look to connected technology to make efficiency gains across their network. One feature that is common across both B2C and B2B is fuel efficiency, and I can only see this getting more popular as understanding of the connected car grows."
Nicolas Nollet, Renault





"Connectivity will bring better navigation in terms of more accurate POI and ease of use. Connectivity brings enhanced safety and diagnostic options, as well as a seamless content experience regardless of whether I'm in a car, at home or in the office. But while connectivity is a solution, it doesn't have to be the only one. I'm very bullish about connectivity but I strive hard to make sure people understand why we're doing something. Ticking the box isn't sufficient. If there is a way of getting better navigation with just your smart device and our SYNC + AppLink technology, that's our definition of connectivity. There's also a range of services that the transportation industry at large is looking at. The concept of geo-fencing or geographical triggering - which is about when I'm near something, do something for me - is a whole new exciting part of the industry. That's not really even about the car. As we move further and further down this path with connectivity, the car itself may or may not become smarter but what it integrates into will be interesting. The vehicle is going to become a smart cog in the wider Internet of Things."
John Ellis, Ford

How will connected car products and services be delivered?_

The demand for connected services in cars is unquestionable; people are ready for it and know what they want. What remains, however, is for OEMs to ascertain how these products and services should be delivered. According to our survey, drivers want to access connected services through the dashboard, with more than 60% of respondents across all markets preferring to access features in this way.

Delivery services safely

OEMs have one primary task - designing and producing cars that enable drivers to get from A to B in a safe, comfortable and convenient manner. Once those key requirements are met, manufacturers then think about adding entertainment to the driving experience. But how that entertainment is delivered is front of mind for every single OEM because safety is a primary concern. Customer preference for dashboard delivery presents numerous safety concerns for manufacturers.

The car industry has a strong track record of successful self-regulation, and when combined with governmental legislation it is unlikely that any infotainment options will be distracting to drivers. For example, in the US navigation interaction is turned off above certain speeds and only voice activation will work. We'll see more of these innovations emerge as connected technology develops and manufacturers find more ways to deliver services in a safe but enjoyable way.

Smart docking is one solution to this. If a smart device screen is duplicated to deliver vehicle-relevant driving enhancement apps into the HMI (Human Machine Interface) display system, drivers are far less likely to be distracted by trying to engage with their smartphones. Advances in

+188

iGR predicts the annual mobile data usage generated by connected cars is expected to grow almost 188% in the next five years

voice recognition technology mean many features can now be controlled vocally, and as the user experience continues to develop, so will the range of services accessed in this way. These advances mean the HMI will become the connectivity hub within the vehicle, helping to enhance the experience, the engagement and the usage.

The good news for the car industry is that **drivers want OEMs to be responsible for these services**, particularly around mechanical support and safety services. However, the story changes when it comes to infotainment and navigation services, where telecom providers have much stronger support (particularly in Brazil where they are more trusted than manufacturers, according to our survey). But this comes with its own set of responsibilities, particularly around how manufacturers deal with the data generated by connected services.

The data generated by connected services is truly enormous, providing a challenge to harness its value.

iGR predicts the annual mobile data usage generated by connected cars is expected to grow almost 188% in the next five years.

The key is to start small: OEMs need to use the data to make incremental improvements to the service that is already offered. Dealer networks, for example, generate most of their profits from servicing rather than sales. The problem is that once a vehicle is out of warranty, customers tend to go elsewhere as the dealer network is perceived as being high cost.

OEMs can change this mind set by using data generated by connected diagnostic services in the car to allow dealerships to contact drivers proactively and flag issues with the vehicle. The challenge here is helping dealerships upgrade their operations to take advantage of this opportunity. However, for those prepared to invest the time and resources, there is a tremendous amount of value to be gained.

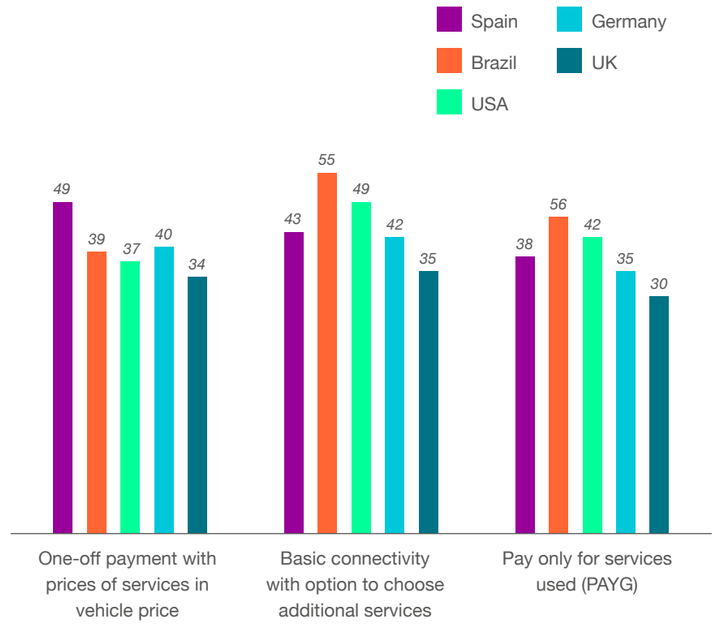
Connected Car Industry Report 2014
03 - How will connected car products and services be delivered?

Payment models

The survey suggests that OEMs still have some way to go before they break out of their traditional role as a manufacturer and become a full, connected service provider. It also highlights the fact that drivers in different countries will prefer to pay for connected services in different ways.

Most Spanish drivers would prefer a one-off payment (49%) while those in America, Germany and the UK would favour basic connectivity with the option to choose additional services. Brazilians are split between the latter and a full-on PAYG model, suggesting a degree of flexibility not seen in other countries.

Payment preferences (%) by market

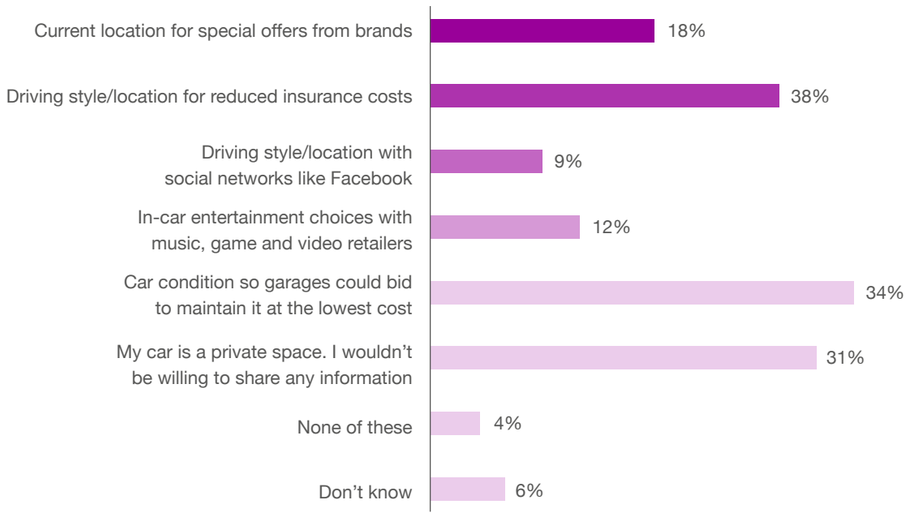


So when OEMs enter a market they will have to be conscious of the local market characteristics that make pricing connected services anything but simple. For example, in India where call and SMS plans can be expensive, a trend has emerged for people to communicate based on the number of missed calls they receive. Dual-SIM phones are another example of phone manufacturers adapting their handsets to allow consumers to take advantage of the wide variety of local call plans.

Interestingly, much like with many popular web and app services, consumers are more flexible than they first appear. Our survey showed that overall consumers would be willing to share some personal information in return for enhanced products and services. Driving style (for reduced insurance) and car condition (for cheaper repair costs) were the most popular options across the board. **Almost half (47%) of drivers in Brazil** would be willing to share information on their driving style and location for reduced insurance costs, with 37% of drivers in Spain happy to share information on their car's condition.

If OEMs do indeed begin to morph into an amalgamation of manufacturer and service provider, they can at least bank on their customers understanding that the best benefits of connectivity come from a two-way relationship.

Information sharing preferences (%)



Connected Car Industry Report 2014
03 - How will connected car products and services be delivered?

Expert insight

"What we are seeing is that the customers would prefer to get the services included in the price of the car, while a recurrent subscription has a lower appeal. Depending on services, brand, or country the offer should be adapted and a flexible platform is a must. No one yet seems to have found the right business model to offer connected services to the consumer, which is why some OEMs have been in the market for years and are still trying to successfully monetise the product. I think at the moment everyone is looking for the best way to recover that investment in connected services; it's the Holy Grail for OEMs."
Massimo Cavazzini, Fiat Chrysler Group

"Customers do not want to pay for these services, that's the bottom line. The business model in which connected services are built upon a business case to provide revenue and profit to the company is a far-fetched proposition as far as I'm concerned. OEMs are currently moving towards more and more free trials, but OEMs realise that once the six-month trials are over consumers just aren't signing up. I think we'll see the emergence of a basic safety package as standard, but the monetisation will come with the top-tier. This will include specific navigation or concierge packages that add value to consumers who want to pay for that extra level of service. But the fact is that connectivity is no longer optional, it is part of every OEMs DNA from now on. The overall benefit is strategic in nature: if you don't have connectivity in the vehicle you become irrelevant."
Henry Bzeih, Kia Motors

"I think if we knew the answer to what to do with the data generated by connected services, it would be the million-dollar question. The first thing that needs to happen is for auto makers to start realising what they can do with that data, what the value is, what they can do legally, and what the consumer is okay with too. At the moment no one has really figured out how to monetise and utilise data while at the same time allaying consumer privacy concerns. Eventually I think the car will be viewed as just another connected device, just as phones are now. Smartphones today follow you around everywhere you go and yet most consumers have no idea. I'm sure that as connectivity in vehicles becomes more ubiquitous we'll see a gradual acceptance of the technology and the use of data from it."
Ben Auslander, VW

"There are growing concerns about privacy of data, and I think OEMs and governments need to reassure consumers about how data is used. It's unfortunate that people get their preconceptions of privacy from big media stories. Google and Apple are setting the tone for how people perceive data privacy. It is very, very clear to us that the data is the consumer's data. Therefore the consumer decides how that data is used. There is no way that we would even envisage to try and take advantage of that data without full consent from the consumer."
Ian Digman, Nissan

"We don't plan to provide enough data for customers to stream movies

"Smartphones are here to stay for the time being and consumers will continue to demand connectivity through their devices in some form"

for hours on end as that's a fairly expensive thing to do. But we know that some customers will want to do that, particularly in a vacation situation to entertain the kids in the back seat, so we will have data plans available working with our courier partners to enable that. On the other hand if there's data we want to deliver such as service notifications, we want to make sure that it can get to everybody. So we won't require a data plan in order to deliver a notification into the car if we think it's urgent enough to make sure that everybody gets it. There are multiple models that are going to be pursued based on the type of service, the type of data it consumes, the breadth of appeal of the service and how many of our customers we think want it and the urgency of delivering it."
Greg Ross, GM

"The embedded vs BYOD debate is a tricky one. At Renault we have developed technology to accommodate both with our R-Link and R&GO solutions. Fundamentally what we want is for the customer to have the flexibility to choose the right solution for them and their needs. I think the debate about the benefits and drawbacks of the two options is rather old now, and instead we as OEMs should be focusing on what the right solution for our customers is. In my opinion both technologies will co-exist quite happily. Smartphones are here to stay for the time being and consumers will continue to demand connectivity through their devices in some form. What role they will play in the long term as part of connected vehicles remains to be seen."
Nicolas Nollet, Renault

"We've had an embedded modem available for some time on select vehicles, most notably our Crew Chief solution which is our fleet management product, as well as the recent electric vehicle and the plug in hybrid electric vehicle products. With that learning under our belt, we announced an embedded modem for the Lincoln car that just launched in May. Predominantly the big use case right now that we're exploring is the value proposition around remote control. Remote start, door lock/unlock, windows down… anything that controls the car in some fashion from a remote device. We're excited about the opportunities, but still trying to understand when it is appropriate to use the embedded modem, when it is appropriate to use the bring-in device, when it is appropriate to use Wi-Fi, when it is appropriate to use any of the other RF connections that might be on the vehicle."
John Ellis, Ford

The future_

Pavan Mathew, Telefónica

I am confident that, by 2020, we will have a high penetration of connected cars (~90%). This will be a mixture of 2G, 3G, and in most instances 4G. Many new cars will have both pre-installed SIM cards and also the opportunity to 'tether' to the driver's smart phone. And there will also be the opportunity to turn existing cars into connected cars using plug in 4G devices.

Ben Auslander, VW

Connected features are growing on an annual basis. Every year, it gets a little more important to consumers in the US, and this growth will continue. It'll become a top five rationale for purchase. You're going to see more enablement and more cars that are connected. I believe that US consumers will eventually demand it, and they won't buy a car if it's not connected. I think connectivity is slowly but surely climbing the list of factors that enter a consumer's decision making process around buying a new car. **The problem is that consumers are used to buying a $500 phone and simply replacing it if it breaks or needs upgrading. This does not translate into the vehicular world at all, currently**. It's harder to be at the forefront of connectivity because it's such a vast, changing world that the carmakers are viewed as being slow or behind in that space. Phones can be rebooted if they freeze in 10 minutes, computers can be restarted… what happens to a moving car? You could build anything you want in a car, but is it going to work five years from now? Is it going to be robust enough that it doesn't just shut off in the middle of your drive? I think it's a little bit of a handcuff and, unfortunately, it gives consumers the image that the automotive space is so far behind when it comes to connectivity.

i Find out more about the future of the connected car with our exclusive video featuring interviews with some of the industry's leading names - bit.ly/cc-tef

Massimo Cavazzini, Fiat Chrysler Group

Thanks to new legislation in Europe and Latin America we'll probably see penetration and connectivity jump from 10 per cent to something approaching 100 per cent penetration in 5 to 10 years. The North American Free Trade Agreement (NAFTA) will also go on being a big opportunity, with APAC being the new market for all OEMs. Today there is a rush from CDMA to LTE so in the short term this will bring broadband to connected cars. **There is still a fragmented value chain so we'll see consolidation and some global players taking the lead in the market**. Think about Europe and its roaming charges and continued fragmentation among the telcos. Will this become a problem in the increasingly globalised automotive market, where a car can be engineered in Italy, produced in Brazil and sold in North America?

Henry Bzeih, Kia Motors

We don't foresee a move by OEMs to grow into the telco space and become providers of data themselves. They will remain separate for the near future. Although it is improving there's still a disconnect in terms of bridging the carriers and OEMs into a common purpose towards serving the customer. AT&T has a connected car platform, Verizon has acquired Hughes Telematics; all the major telcos are moving into the connected space. However, they maybe pondering the ecosystem, but I don't see a significant movement. The carriers are thinking of their own bottom line. **I do see a gap in strategy for Telcoms though and I have grave concerns**. Customers should be able to add their vehicle to their wireless account with the carrier of their choice and be provided unlimited data. This is the largest barrier to the widespread adoption of the connected car currently. For example, we're currently talking about vehicles with 4G LTE but at what cost and with which carrier? Who does the customer have a contract with? It is great that connected vehicles will be able to stream enormous quantities of data, but at what price point, and who pays?

Connected Car Industry Report 2014
04 - The future

Ian Digman, Nissan

In the next 12 months I think you're going to see a plethora of systems on the market from every OEM. The systems are going to be at a high level and pretty similar in what they offer. But they will have different qualities of execution, both in terms of graphical design and ease of use. For example, the current Apple system almost comes as a standalone secondary system to the head unit. Systems like Nissan are more integrated into the base offering, but offer a slightly different graphical interface. **Over the next three to five years the onset of eCall will be a game changer in that every car is going to have to be connected through an embedded communication device**. Having that hardware on the car creates an opportunity for OEMs to have a different relationship with the car and the consumer, which we can take advantage of.

Greg Ross, GM

The roll out of high speed and high quality cellular networks is uneven around the world. Some markets are more developed than others; they have higher density and higher reliability. That's a core technical component that is essential and has certainly had an impact on our roll out plans, especially as we are trying to schedule 4G deployment. **The other challenge is around cycle plans in the car business which are very long, which does hinder the industry's agility and ability to respond to consumer trends and demands in a timely fashion**. For example, we are making plans right now for things that will not happen until 2018/2019, something unheard of in smartphones for example. So OEMs have a challenge ahead to continue innovating while bringing down cycle times. Infotainment options in the car need to be updated, and the wider connected services need to be refreshed often enough to keep up with consumer expectations elsewhere.

Nicolas Nollet, Renault

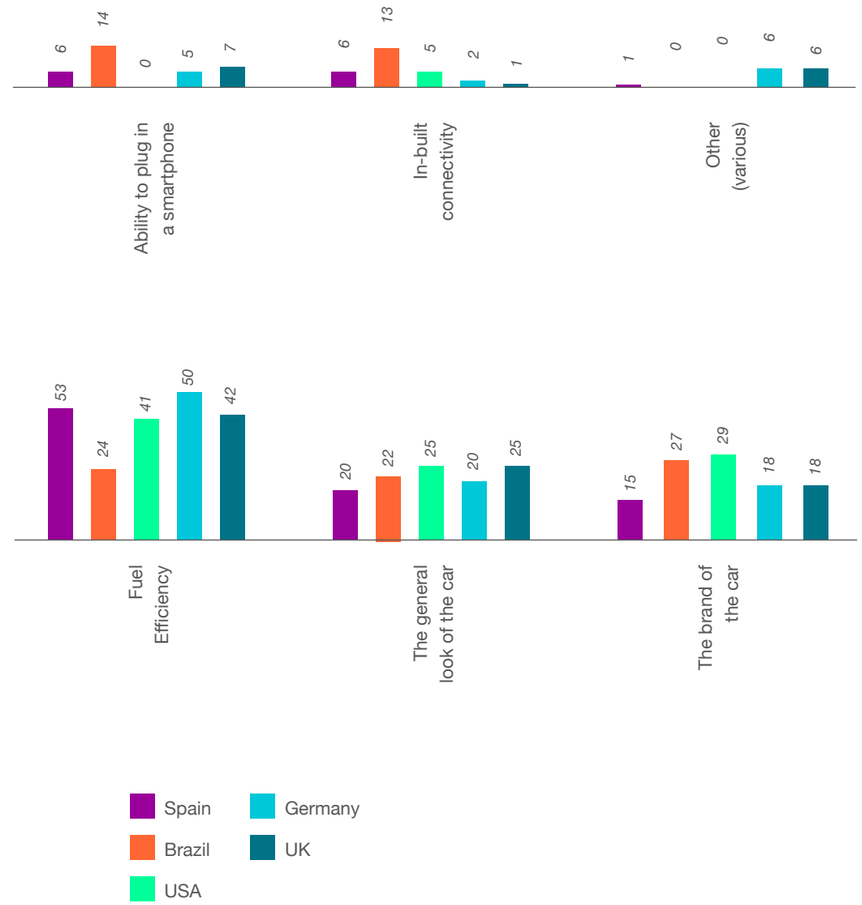
I see a huge growth in demand in the short to medium term for connected services. Navigation, safety and diagnostics will continue to be the main drivers behind buying decisions, and we can expect to see huge investment in these three areas from both OEMs and third party brands. **The main thing holding back our industry at the moment is our relative naivety**. We're still learning about the potential of this very exciting technology, and trying to understand the value that it not only brings to our customers, but also to our business. The next few years will be key for OEMs as we begin to get a clearer picture of how connected cars fit into markets around the world, and how they will help shape the cities of tomorrow.

John Ellis, Ford

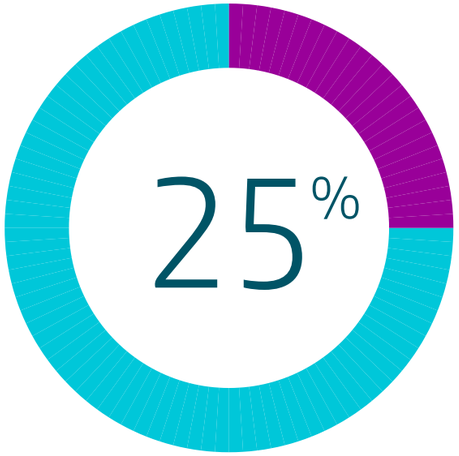
There's a lot of companies saying that by 2020 they'll be introducing autonomous cars so I think we can expect to see some very strong approaches in autonomy. This of course leads into all sorts of short-term discussions about insurance business models and physical infrastructure innovations. **Autonomy obviously has implications for car ownership**, and as a 110-year-old company we're obviously taking our heritage extremely seriously as we look forward to the next 100 years. But over the next decade I think we'll see autonomy overshadowed slightly by the use of smart materials in vehicles. Things like materials that deflect water, refract light or change colour. And then beyond that I think we'll start to see some very cool stuff around nano electro-mechanical materials where you could start doing things with self-forming circuitry and self-morphing materials. These advances start to change our perceptions of how form and substance are influenced by the environment, overhauling what we understand about the current dimension of physicality.

Appendix_

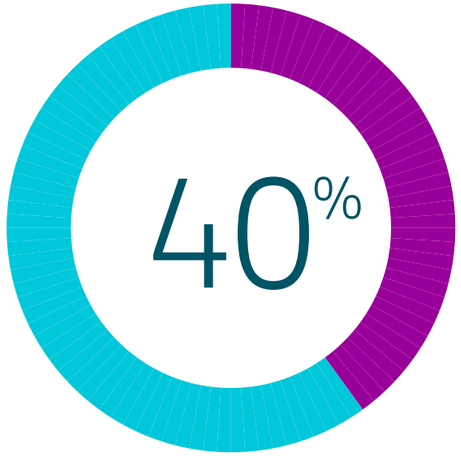
Most important features in car buying decision 18-24s
Features ranked in first place



By the time people own connected cars, the technology will be so advanced that it will be impossible to hack it

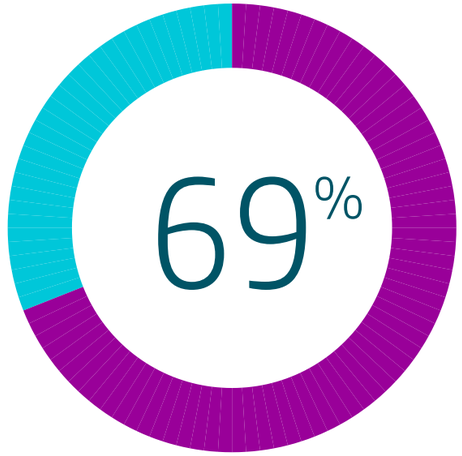


Agree

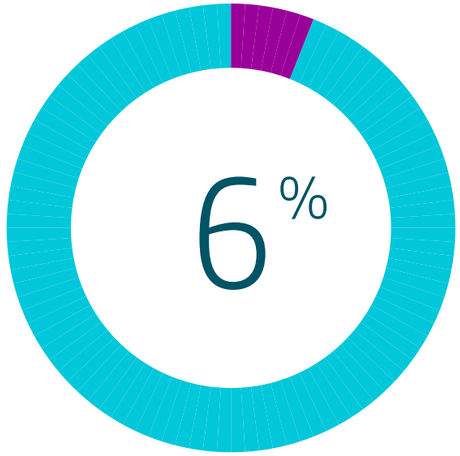


Disagree

In today's technologically advanced word, I should be able to access my car's diagnostics as easily as I can check my phone/tablet



Agree



Disagree

Methodology_

For the Connected Car Report 2014, Telefónica commissioned YouGov to survey 5,012 adults across five markets, aged 18 or over, and that held a valid driver's licence. It spoke to 946 respondents in Spain, 993 in Brazil, 993 in the USA, 1061 in Germany and 1019 in the UK between 13th January and 20th January 2014.

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