

THE FUTURE OF MOBILITY IN A POST-PANDEMIC WORLD



2020 will forever be known as the 'COVID Year.' The world is reeling from the deadliest pandemic in modern history, with thousands of people dying every day, others without contact with loved ones for months at a time, and economies all over the world suffering their worst decline in decades.

But progress must continue. And in the background, technological advances are still changing the world we live in. One of the areas enjoying such progress is transport and mobility.

So, after publishing our first 'Future of Mobility' insight, and with the changes the world has seen over the past 18 months, we are looking at the impact the coronavirus pandemic has had, if any, on the way we are choosing to move ourselves and our vehicles for the next generation.

ELECTRIC VEHICLES

THEY'RE HERE TO STAY

One thing the pandemic has clearly highlighted is the human impact on the environment. Back in April and May 2020, social media sites were bursting with pictures of nature, clear skies and fresh waterways.

Then, the comments below were overwhelmingly positive, with more people enjoying morning walks and connecting with the outside world, while becoming more aware of the damage humans are inflicting on the planet. However, we know this is not likely to be a permanent pause on human activity, therefore alternatives must be provided to revive the planet's lungs.

Electric vehicles (EVs) have long been seen as a fundamental progression in the fight against climate change, and one positive from the pandemic could mean that there could be a larger shift from fossil fuels to cleaner, more environmentally friendly alternatives.

Despite the pandemic, global adoption of electric vehicles continued. Sales rose by 43% in 2020 to more than three million vehicles worldwide, according to Swedish consultancy firm, EV-volumes.com.

Despite consumer enthusiasm for green solutions, research from LV= General Insurance¹ revealed the top three barriers to buying an electric vehicle have remained the same over the last year, with lack of charging points currently the top reason given (52%), followed by range anxiety (the fear the battery will run out mid-trip) and vehicle cost.

In April 2019, LV= GI launched the UK's first car insurance product developed solely for electric vehicles. The product provides tailored cover to meet the specific needs of electric car owners and includes cover for home charging cables and wall boxes, the supply of electric or

hybrid courtesy cars and access to a network of specialist electric car repairers across the country.

Despite the rise in electric vehicle sales, research by the National Audit Office has suggested that, in Britain, carbon emissions from passenger cars have fallen by only 1% since 2011, due to the rise in popularity of sports utility vehicles (SUVs).

However, the government has addressed all of these points by announcing plans to phase out and ban the sale of new petrol and diesel cars by 2030, as well as a fresh round of funding to "support 169,000 jobs and maintain the UK's leading position in the global automotive market"². This is underpinned by a £1.8bn investment in infrastructure and grants to support and promote greener car journeys.

A Department for Transport spokeswoman said:

"This government is going further and faster to decarbonise transport by phasing out the sale of new petrol and diesel cars and vans by 2030.

"Ultra-low emission vehicles (ULEVs) now represent nearly 11% of the new car market. Alongside the billions we are investing to support industry and consumers to make the switch to cleaner vehicles, we are proud to be a global leader in the development and manufacture of ULEVs. We will set out a plan later this year on how we will deliver these new ambitious phase out dates."



Over the next decade, the three main barriers to people buying EVs will be either reduced or taken down, with vehicle technology and road infrastructure evolving and adapting to meet the challenges of all electric journeys.

It's too early to speculate on what the 'new post Covid-19 normal' will look like, but the pandemic has shone a light on flexible and

home working which could have considerable impacts on commuting trends in the future. If car ownership and mileage both reduce at the same time as greener alternatives enter the mainstream, then there is the possibility that journeys will be shorter and more efficient with less congestion at peak times.

BUT WHAT DO WE MEAN BY ELECTRIC AND WHY IS IT SEEN AS A GREENER OPTION?

Electro-mobility could prove to be a fundamental aspect in achieving the ambitions of the Paris Agreement, which aims to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels

There are three types of EV, all with varying degrees of reliance on different power sources:

- Battery Electric Vehicle (BEV) – fully electric
- Plug-in Hybrid Electric Vehicles (PHEV) – combine electric with combustion engine
- Hybrid Electric Vehicle (HEV) – combine electric with combustion engine generating electrical power

While all variations are seen as better alternatives to traditional internal combustion engines (ICEs), it is the BEVs which are considered the cleanest and greenest.

According to Allianz SE's 'The EV-olution of Mobility' report³, EVs produce between 17% and 30% fewer emissions than ICEs. Besides, as more electricity is generated by green sources, the lifecycle emissions of a typical electric vehicle could be cut by at least 73% by 2050.

Over 100m electric cars are expected to be on the roads by 2030 with annual sales at around 20m worldwide. This would cut demand for oil products by 127 million tonnes per year.

Europe is the second largest market for electric vehicles, behind only China.

When looking to the future, Deloitte⁴ figures predict a compound annual growth of 29% for EV sales. Deloitte also predicts that EVs would secure approximately 32% of the total market share for global new car sales, with £30.1m being sold each year by 2030.

Finally, Deloitte's figures suggest China will hold 49% of the global EV market, Europe will account for 27%, and the United States will hold 14%.

Adoption of EVs has risen rapidly in the past 10 years. The same report reveals around 7.5 million electric cars were estimated to be in service globally at the end of 2019, up from 5.1 million the year before. And with governmental action, that rate of implementation is poised to increase further over the next decade.

Allianz SE's 'The EV-olution of Mobility' report



ARE THERE ANY DOWNSIDES TO GOING ALL ELECTRIC?

While the potential is there, no worldwide effort for progression on this scale is without setbacks, and with electric vehicles, it is no different. Most notably, those surrounding energy sources and charging infrastructure.

The battery, the most important component of the electric vehicle, is also a component that can bring its most prominent risks:

- It is expensive. The cost of a battery cell is considerably more than a traditional combustion engine.
- Damage to the battery could result in much larger repair bills, as the complexity of the build, and therefore the fix, increases.
- Product liability insurance will be important for manufacturers and suppliers. Ensuring the components work properly, otherwise risking large volume of expensive claims.
- Fires - if the electrical components and circuits are defective, or if lithium-ion batteries combust when damaged, overcharged or exposed to excessive heat. Besides being hard to contain, high voltage battery fires could release copious amounts of toxic gases.
- Cyber risk – many electric vehicles are also connected vehicles, which use and produce data that is transmitted over networks. That data can be hacked.

“EVs will consist of fewer but more integrated parts and components.” says Daphne Ricken, Senior Liability Underwriter at Allianz Global Corporate and Specialty.

“What may have been three parts in a conventional car previously could be one part in an electric car today. However, the lower number of parts are increasingly connected through sensors and embedded software, adding a new layer of complexity and raising questions around how these parts interact and which producer or supplier is liable for a potential defect or faulty control,”

“The increased complexity of the automotive supply chain and the reliance on software and technology producers will lead to new exposures and split liabilities in the value chain.”

“If the battery in an electric car has to be replaced, it can result in a total loss in many cases.”

Carsten Reinkemeyer, Head of Vehicle Technology and Safety Research at the Allianz Center for Technology (AZT) Automotive

BUMPS IN THE ROAD

Those previously mentioned projections for manufacturing and sales were made before the pandemic, and 2020 caused disruption to dealers, manufacturers and the supply chain.

According to the China Association of Automobile Manufacturers, sales of new **EVs plummeted by 54% in January 2020**, when the country was at the height of its pandemic crisis.⁵

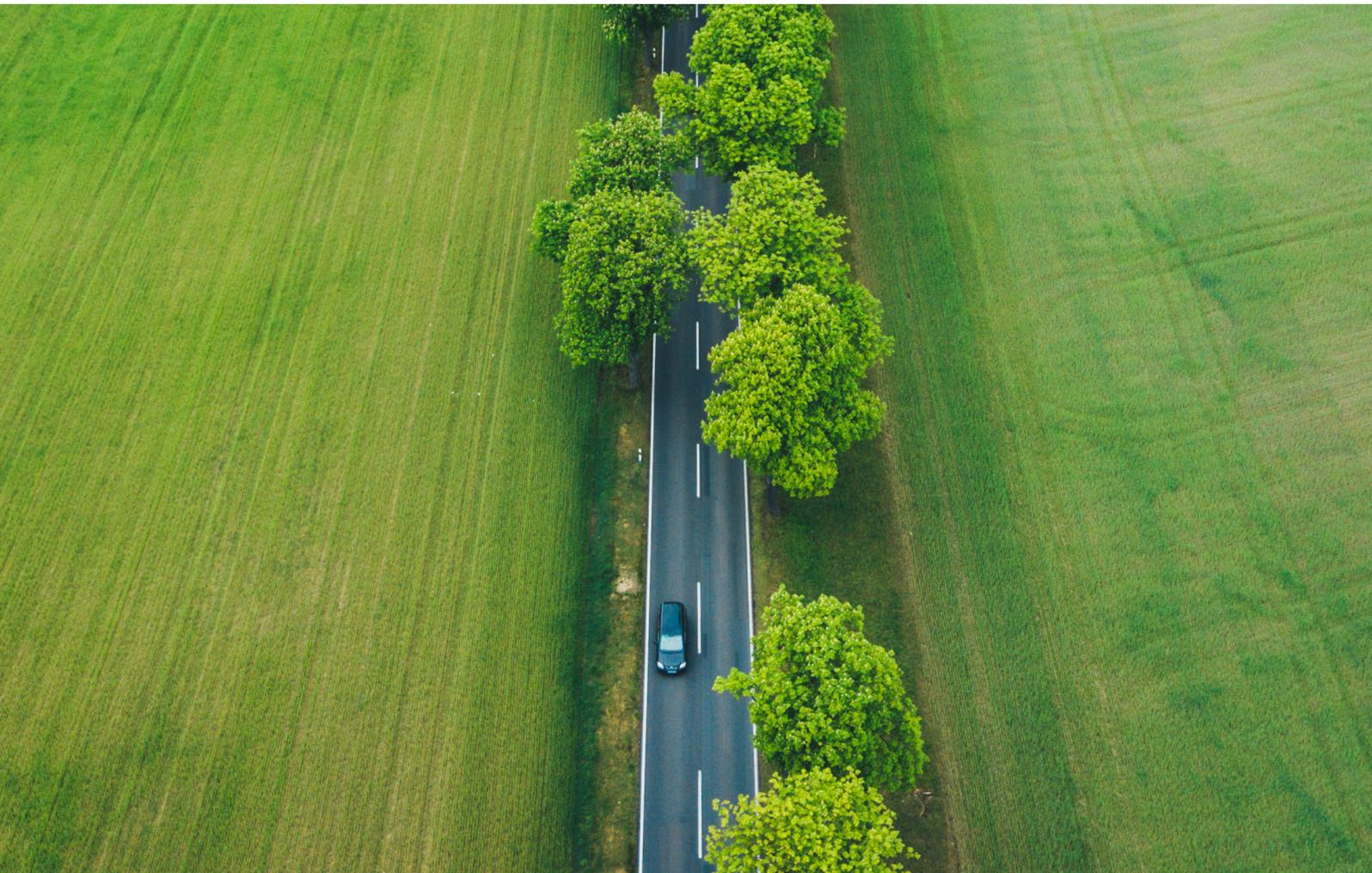
As well as this, the number of models available to European buyers was projected to rise from 100 to around 175 in 2020. But that was impossible to achieve with limited resources.

ENCOURAGEMENT IS STILL THERE

However, there are still encouraging signs. Signs that remind manufacturers, insurers and consumers alike that the technology is worth exploring and investing in.

In the first two months in 2020, 6,500 EVs were sold in the UK, more than triple the year earlier.⁶ So, the appetite for electric vehicles is there, and government incentives to increase the proportion of EVs on the road over the next few years gives eco-minded consumers encouragement.

Across the pond, similar encouraging signs are emerging. The United States rejoined the Paris Agreement shortly after President Joe Biden's inauguration. This is a landmark decision for the country that ranks second in the world, after China, for greenhouse gas emissions - and which is also a country that has been pioneering electric vehicle technology thanks to companies such as Tesla and Ford. This will be further encouragement to the world we can find less polluting ways of moving around.



E-SCOOTERS AND BIKES

GIMMICK OR SOLUTION?

Another form of transport that has seen a huge increase in popularity over the last few years is e-scooters and e-bikes.

E-scooters and bikes have been popping up more and more in the cities and towns across the UK as part of a nationwide trial period to see how well these modes can integrate themselves within current society.

Places such as Middlesbrough, which saw an initial fleet of rental e-scooters rolled out in 2020, have been seen as an easy way of getting around quickly, with less effort.

The government trials are being carried out following regulations that were introduced on 4 July 2020. Trials are expected to continue for 12 months, however these could be extended.

Benefits include:

- Offer eco-friendly alternative to public transport or driving
- Low-cost
- Complement existing transport options, with a top speed of 15.5mph
- Allow people to socially distance easily while travelling around.

“E-scooters may offer the potential for convenient, clean and cost-effective travel that also helps ease the burden on the transport network, provide another green alternative to get around and allow for social distancing,” said Transport Minister Rachel Maclean. “The trials will allow us to test whether they do these things.”



THE RISKS

Allianz Partners has an agreement with urban electric bike and scooter rental company, Lime, to provide insurance cover for its e-scooters and bikes.⁷

As with any new technology, the risks associated with e-scooters mean that getting them on the road is something of a balancing act, for riders, insurers, and for the government too.

Next to the positives, they bring a new set of risks that must be fully understood before they are given the green light.

- Riders of privately owned e-scooters do not need a license or experience to operate this equipment. For rental e-scooters, users must have a car, motorcycle or moped license.
- Other road users may not be used to this equipment either, increasing risk of collision.
- They are virtually silent, so pedestrians and other road users may be unaware of their presence.
- When parked, e-scooters can be potential trip hazards for pedestrians.

THESE RISKS HAVE PROVED TO BE REAL

According to research by Quartz⁸, **29 people have died in e-scooter related accidents between August 2018 and February 2020.** Most of these were as a result of a collision between an e-scooter and a vehicle, while others involved pedestrians being fatally hit by an e-scooter.

Other research found that 20 in every 100,000 e-scooter trips resulted in injury, with almost half of those involved suffering head injuries⁹. Industry experts have also raised questions after a woman was found to be three times over the drink-driving limit while using a rental scooter. This emphasises the risk and need for clear education and regulation around the safety of using this equipment.

That is why, as part of the partnership with Lime, Allianz Partners has launched a global road safety education programme for e-scooter riders, as well as sponsoring 50,000 helmets over two years.

The two partners have co-designed a two-year safety campaign to run until March 2022, which includes the helmets, scooter certification, where riders will be invited to participate in an interactive test about e-scooter road safety, and local ride safety training.

The UK government's trials, which are expected to run until the end of August 2021, will provide valuable insight into the risks and what's required before these vehicles can be used more widely on the UK's roads. The data will not only inform general attitudes and road safety approaches but also legalities.

Given that various modes of transport already share the roads, there are questions to be answered about whether this new mode is more aligned to a bike or e-bike, with no compulsory insurance, or a motor vehicle, with compulsory insurance.



PEER TO PEER



Often a term linked to the gig economy, Peer To Peer car sharing is when a vehicle owner rents out their car to others on a short-term basis.

With apps making connectivity instant, this method of car rental is quick, easy and offers flexibility to people who might not need, want or be able to afford their own vehicle.

The model is particularly attractive for millennials, who largely use public transport but occasionally need a car for shopping, or travel to locations less accessible by buses and trains.

NUMBER OF P2P CAR-SHARING VEHICLES GLOBALLY¹⁰

2015	200,000
2020	440,000
2025	990,000 (projected)

The upsides:

- Customers can choose exactly the type of vehicles they want to hire
- Owners can make money from vehicles that would otherwise be idle
- The websites make money from a small commission on every booking.

The downsides:

- Trust is required from both sides and different apps have different terms and conditions
- Generally, cars have to be returned to their original location
- The companies are providing a platform and service, they are not automotive experts.

Because of the way the coronavirus spreads, restrictions have been imposed on the way people share places and equipment, and the gig economy has suffered as a result. While car sharing and hiring has slowed over the past year, it is likely to restart when movements resume in a safe way.

AUTOMATED LANE KEEPING SYSTEM (ALKS)

ALKS - Using sensors to detect the edges of a motorway lane, ALKS can control the movements of a vehicle - without driver command.

The Automated Lane Keeping System has been around for some time, and many consider it to be the first step towards fully autonomous vehicles. As such it's really important to distinguish between 'assisted' technology and 'automated' technology.

Assisted technology:

- can be fitted to an already 'in-production' vehicle
- helps the driver keep control of the vehicle
- increases the safety measures of the car, without taking control of the vehicle from the driver.

Examples of assistance can be found in many modern cars, but one pioneer is Tesla. When the driver indicates on a motorway, the car will make sure that there is enough space to move into the desired lane, and if it is safe to do so, will move into the lane by itself. The car assists the driver but does not take away control.

Autonomous technology:

- needs no input from the driver to be able to make decisions

An example of this is the automated braking system in some models that will use sensors to automatically apply the brake if the car feels there is an imminent danger of collision.

Under the terms of the Automated and Electric Vehicles Act (AEVA), a vehicle should not be considered autonomous unless it is capable of 'safely driving itself'.

At the moment, the technology around ALKS is not ready to be classed as 'automated', as it still requires the driver to be in control of the car.

However, some communication surrounding this technology is becoming alarmingly close to describing it as autonomous, and herein lies the danger. If this technology is rolled out while it is described as 'autonomous,' consumers may believe that there needs to be no input from them, which could lead to accidents.



If accidents occur involving the technology, which is designed to increase road safety, public confidence will plummet. This could stall the adoption of the technology, which is designed to increase road safety.

“We need to make sure we are confident it works in real-world situations before we are comfortable rolling it out wider.” – Gerry Ross, Head of Commercial Motor, Allianz UK

Insurers want to see the safe roll out of automation as quickly as possible but there is much to consider.

This technology, which only slightly changes how the car operates, could represent a huge shift in liability from an insurance perspective, from the driver to the car.

If the driver becomes a passenger and can claim injury then in theory the insurer will have a right of recovery against the manufacturer. But causation may be disputed and difficult to prove without legal precedence.

There’s plenty to be thought through before this technology can be introduced fully on UK roads; practically, legally and in terms of customer education.

“The education piece is very important. If our customers (fleet managers) are buying vehicles that can be classed as automated, it is essential they ensure their drivers are well educated in how to use the vehicle.” – Gerry Ross



AUTONOMOUS VEHICLES

Autonomous Vehicles are something companies all over the world are trying to conquer, with rigorous testing being carried out every day.

The UK government originally said its ambition was for Autonomous Vehicles to be on the road by 2021. However, with the ongoing coronavirus pandemic, it is not clear whether that ambition is still in place, as testing has had to be halted globally.

There have also been certain issues with testing, including well publicised crashes that in some cases proved to be fatal.

However, there are varying levels of automation, and some of those lower levels are already being seen on the road today.

THE DIFFERENT LEVELS OF AUTOMATION

0	The human driver controls all the driving – steering, brakes, acceleration.
1	Most functions are controlled by the driver but a specific one, such as steering or braking, can be done automatically by the vehicle’s advanced driver assistance system (ADAS).
2	ADAS can control both steering and braking/accelerating under some circumstances but the driver must pay full attention at all times and perform the rest of the driving task.
3	An automated driving system can perform all aspects of driving under some circumstances. The human driver must be ready to take back control at any time the automated system requests.
4	An automated driving system can perform all driving tasks on suitably maintained roads and the driver does not need to pay attention in these circumstances.
5	The automated driving system does all the driving in all circumstances – no human intervention is required.

Currently, the highest level permitted on UK roads is two, where advanced driver assistance systems such as adaptive cruise control, ALKS and autonomous emergency braking can support the driver, but the person behind the wheel remains responsible for the driving.

Moving to level three presents some challenges. At this level the vehicle can perform all aspects of the driving, but the driver must be prepared to take back control when required.

The levels of automation yet to be cracked are levels three, four and five. But it is a question of when, and indeed if, we get there.

Speaking to WardsAuto at an event in Las Vegas last year, Volkswagen Autonomy’s Alex Hitzinger said full Level 5 autonomy could be reaching just too far.

“This is one of the hardest problems we have. This is like we are going to Mars. Maybe it will never happen.”

Part of the difficulty surrounding true autonomy is the amount of liaison needed between technology companies, vehicle manufacturers, governments, insurers, the legal profession and more. No one entity can answer when the real autonomous revolution will begin but in the meantime cross sector innovation and collaboration will need to take place to shape this ambition.

WHAT NEEDS TO HAPPEN FROM AN INSURANCE STANDPOINT?

The complexity comes when determining the liability for a crash. Is it the fault of the driver or the vehicle? The insurer would need that information from the motor manufacturer or component supplier.

Insurers need to have the customer at the heart of any action they undertake, so the affected parties can have their issues resolved quickly and efficiently. Therefore, it is up to the insurer and the manufacturer to come up with a process that goes on behind the scenes that allows any possible situation to be resolved. Data access and ownership is a key point to consider, and another example of the cross collaboration needed as legal rules will need to be defined.

Infrastructure also needs to change to accompany the level of autonomous progression. The road network is not suited to higher levels of autonomy. And the investment required to facilitate this is substantial. Similar to ALKS, if there are errors with the tech because of a rushed rollout, the industry could miss its chance for adoption as public confidence will take a hit.

Over the next five or so years, autonomous vehicles are likely to make an appearance, albeit in a limited way. This could include more use in the commercial space, for example, platoons of trucks and public transport, or in more restricted areas, such as on college campuses or at airports.

We are using our global network of Allianz companies to share knowledge, best practice and ideas. We're looking at underwriting, researching the risks and opportunities and talking to manufacturers about what an autonomous motoring landscape could look like for them.

There will be large effects on fleet and personal lines, the emergence of risk, product liability and cyber, and as a global insurer, we're preparing now for the exciting challenges of the future.



WHAT HAPPENS NEXT?

First and foremost, the world must find a universal solution to the coronavirus pandemic. But as vaccines have been introduced to the market and have begun the rollout process, there are encouraging signs that civilisation will get back to some form of normality soon.

In terms of the future of mobility, rigorous testing needs to continue, and in some cases stepped up a gear, for a safe introduction to the new world.

Allianz is eager to collaborate with institutions and thought-leaders to ensure the tech is at the best it can possibly be, with all risks considered, as we feel it is imperative that we get it right the first time around. Otherwise, we fear it could be a case of chance squandered, rather than chance missed.

Allianz also believes that legislation must be in a place where it is able to keep up with the technology and is ready to adapt along with it, in order for there to be the best chance of successful rollouts.

Finally, and possibly most importantly, Allianz believes the communication around these technologies must be clear, concise, and have a universal standard throughout. Consumers who are going to be using this technology on a day-to-day basis need to have a clear idea of what it can and cannot do for them, how much they can rely on it, and the potential dangers of not being fully informed.

However, we are committed to these exciting developments and want to see safe and successful implementation and adoption.

We understand that there is a long road ahead, and we are there, lending our support and expertise, until the very end.

FOOTNOTES

1. Time to re-charge? Government incentives not enough as only a third of drivers consider switching to an electric car (lv.com)
2. Government takes historic step towards net-zero with end of sale of new petrol and diesel cars by 2030 - GOV.UK (www.gov.uk)
3. The EV-olution of Mobility (allianz.com)
4. Electric vehicle trends | Deloitte Insights
5. European plug-in car market exceeded China in January 2020 (motor1.com)
6. 20190404-TheView-Mobility-Electric-Vehicles.pdf (allianz.com)
7. Allianz and Lime jointly address safety needs in micromobility industry
8. At least 29 people have died in electric scooter crashes — Quartz (qz.com)APH_Dockless_Electric_Scooter_Study_5-2-19.pdf (austintexas.gov)
9. Peer-to-peer car-sharing is here to stay | Automotive World

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