

Course Reader

Articles	3
'Rude drivers will swerve in my lane': are Tesla owners paying the price for Musk hate?	3
Article contents :	3
Word list :	5
Summary :	6
Link :	6
The skids are all right	6
Article contents :	7
Word list :	8
Summary :	10
Link :	10
Are hydrogen fuel-cell cars the future?	10
Article contents :	10
Word list :	14
Summary :	16
Link :	16
How driverless cars will change our world	16
Article contents :	16
Word list :	22
Summary :	22
Link :	23
Why car dealers may face a bumpy road ahead	23
Article contents :	23
Word list :	26
Summary :	26
Link :	26
Porsche 911 GT3 RS and Cayman GT4 RS head to head – which is best?	26
Article contents :	27
Word list :	29
Summary :	29
Link :	29

Articles

‘Rude drivers will swerve in my lane’: are Tesla owners paying the price for Musk hate?

Alaina Demopoulos

Article contents :

US owners say they’ve been on the receiving end of road rage, but it may be more about **EVs** than the CEO himself

she had returned her model for a Volkswagen electric vehicle, prompting jokes from Elon Musk and **conservative** commentators about the German manufacturer's Nazi origin story. Milano said she had ditched Tesla due to Musk's ownership of Twitter.

While Tesla owners do not seem to be following the actor's move en masse, some note that they have been on the receiving end of road rage directed toward their vehicle choice.

Although there's no official data to prove that Tesla drivers get more hate, an Axios report from August found that Iowa's "Tesla drivers are **routinely heckled**, cut off in traffic, and blocked from charging stations." Many put the blame on the company's CEO, Elon Musk, and the never-ending news cycle devoted to his frenzied Twitter takeover. A July poll from the research analytics firm Opinion Science found that 54% of respondents viewed Musk "negatively" – and some Tesla drivers believe they are suffering the impact of his reputation.

Tesla drivers interviewed by the Guardian say they have experienced anti-Tesla sentiment, but mostly from those who hate electric vehicles rather than Musk specifically. "Random rude drivers will swerve in my lane to yell at me, or turn on a heavy diesel exhaust that blows black smoke," Paul Albertson, who lives in Beaverton, Oregon, told the Guardian. It never happens when he drives his two other cars, a vintage 1948 Chevy and a 2014 Traverse. The culprits are most often men driving "larger pick-up trucks", he said.

John Shevelew doesn't notice too much road rage at home in York, Pennsylvania, where he is president of the state's Tesla Owners Club. Things change when he drives through the south. "I go to Texas a lot to see my daughter in Austin, and in Arkansas, Mississippi, those places, I run into, let's say, less-than-friendly looks," he said. "You get someone in a big diesel pickup truck who likes to express their dissatisfaction with the idea of an electric car."

Laura Kennedy, who also lives in Pennsylvania, agrees. "It's almost always a guy in a pickup truck [who does something]," she said. "I don't think I've ever been flipped off in my life as much as I have in the past year or so."

Teslas are common in the Bellevue, Washington, area, where Theresa Ramsdell lives and has owned two models since 2016. "People cut us off on the **freeway**, give us the finger, yell at me through the windows," she said. "A couple of people have not exactly tried to push me off the road, but drive real close to the side of my car and smile. It's happened to me twice going at 65 mph and it's scary."

Marc Geller, spokesperson for the Electric Vehicle Association and a Tesla owner himself, has owned a battery-powered car of some sort since 2000. He said that road rage **traditionally** came from rightwingers who see the electric vehicle drivers as crunchy liberals.

But now that Musk has become something of a conservative hero – telling his followers to vote Republican in the midterms and reinstating Donald Trump’s Twitter account – he’s a foe to many electric vehicle fans, too.

“There’s an irony here in that Teslas have long been a hate magnet for various reasons,” Geller said. “They were the subject of road rage because they represented the environment and were perceived as the **vehicular embodiment** of that culture war. But now here we are, and some folks on the left are having a knee-jerk reaction because Elon Musk has taken this **ominous** turn to the political right, so now they’re throwing the same bricks.”

One 22-year-old man who spoke to the Guardian and just co-signed with his parents on a Tesla calls the car “the best purchase” he’s ever made. Minus one caveat: people keep cutting him off.

“I noticed the road rage within the first week I got it,” said the man, who lives in Thousand Oaks, California, and didn’t want to be publicly outed as a Tesla driver. “I’ll just be driving the same speed I had in my old Ford Fusion, but they’ll cut in front of me and drive really slow, or prevent me from switching lanes. On city streets I’ll go the speed limit and cars leaving parking lots will decide to cut in, making me stomp on the brakes. That’s happened eight times this month.”

Word list :

EVs	EVS: Environmental Studies or Environmental Sciences.
conservative	Avoiding change and preferring traditional ways.
routinely	Things that are usually done
heckled	To interrupt a public speech or performance with loud, unfriendly statements or questions

freeway	a Dual carriageway main road
traditionally	According to tradition→ a belief, principle, or way of acting
vehicular	related to vehicle
embodiment	someone or something that represents a quality or an idea exactly
ominous	suggestion that something is unpleasant

Summary :

Tesla owners say they've experienced anti-Tesla sentiment, but mostly from those who hate electric vehicles. Many put the blame on the company's CEO, Elon Musk, and the news cycle devoted to his frenzied Twitter takeover. A July poll found that 54% of respondents viewed Musk "negatively". Tesla CEO Elon Musk has become something of a conservative hero, but he's also seen as a foe to many electric vehicle fans. One Tesla owner says she's noticed an increase in road rage from left-wingers who see electric vehicle drivers as crunchy liberals.

Link :

<https://www.theguardian.com/technology/2022/nov/28/tesla-drivers-elon-musk-twitter-road-rage>

The skids are all right

Tim Dowling discovers the joys of driving a car sideways (on purpose)

Tim Dowling

Article contents :

I'm parked at the far corner of a test track at the Hayes motor museum in Sparkford, with my seatbelt on, an instructor by my side, and an orange cone just off the **starboard** wing mirror. I could for all the world be preparing to execute a three-point turn using forward and reverse gears. The instructions from Declan, my teacher, however, are somewhat different: turn the steering wheel all the way to the right, put the car in first, rev the engine up to 4,000**rpm**, and dump the clutch. **BSM** this ain't.

The instant I do this, the back tyres squeal and the rear end attempts to overtake on the left. The car arcs around the cone in an agreeable half-doughnut before the tyres suddenly catch and we go shooting off - on to the grass verge. "Not enough power," says Declan. I **meekly** reposition myself near the cone and try again.

Welcome to Drifting 101, or the fine art of driving sideways - or, to be a bit more specific, the fine art of driving sideways on purpose. The history of drifting is murky, but it is said to have evolved from a form of illegal hill-racing in Japan. At some stage, the **skidding** became the end rather than the means, and in its country of origin drifting has grown into a wholly **legitimate** sport: cars career around tracks in a balletic series of controlled fishtails, in front of judges. It's like ice-driving, but on asphalt. Although the top competitors drift through turns and straights at more than 100mph, speed has never been the point. It's about how sideways you are. And it's about style.

Drifting also comes with an **ethos** at odds with more traditional motor sports: the drivers are not prima donnas, the sport is less aggressive and the cars tend to be modest 10-year-old production models, the kind of things salesmen drive. Huge horsepower isn't necessary. Drifting is meant to be cheap, cheerful and crowd-pleasing. It is to regular racing (or "grip racing" as drifters call it) what snowboarding is to skiing: rougher, readier and completely **baffling** to the traditionalist.

Yet drifting is starting to take off in Britain, according to John Chambers, who has set up Drift Academy to teach the basic skills of the sport. "Drifting took place in Japan almost exclusively until three or four years ago, then a bit in the US," he says. Today there are drifting competitions across Europe. And Chambers is pushing the training not just as a way of getting into the sport, but as a lesson in driving more safely in general.

With the **ubiquity** of computer-aided handling, most ordinary drivers have never experienced a loss of traction, and wouldn't know what to do if they did. You can bring your own car if you like (virtually any rear-wheel drive vehicle can drift) or train in one of the Academy's

Mazda MX5s, which have lightly modified **differentials** and suspension, and are equipped with drift-friendly tyres (drifting is, as you might have guessed, rather hard on tyres). One of Chambers' other aims is to drag British drifting into respectability before its reputation can be damaged by reckless boy-drifters: with its underground roots, drifting has always had the potential to flourish on the wrong side of legality. "I want to take it off the streets and put it somewhere safe," says Chambers. "And teach them properly."

The motor-racing world hasn't really cottoned on to the whole skidding thing yet. At "track days", where amateurs pay to run their cars round real race courses, driving sideways is frowned upon. So drifting tends to take place at **disused** airfields. "In Japan they have purpose-built tracks," says Chambers. If we had **venues** like that here, he adds, "our standard would be up to the Americans and the Japanese in a couple of years." As it stands now, a novice drifter can train up to British competition standard in a day. Unless that novice is me.

Although I've been round the cone a few times, I still can't overcome my **reluctance** to apply more power as the car loses traction. Declan shows me how to let the wheel correct itself as we spin out, but the **compulsion** to steer is overwhelming. At this rate, I will never graduate to the full figure-eight. The only way to get a taste of real drifting is to climb into the passenger seat and let Declan take over.

So off we go, round the track in a **cacophony** of roaring and squealing, at least some of which is coming from me. We're only going about 40mph, but it feels faster because the car is **perpendicular** to the track, my passenger window facing forward. There's a lot of smoke and commentary from Declan about "opposite wheel lock", "oversteer" and "angle of drift", little of which registers because my helmet is banging against the car's interior.

It is intensely good fun, once you accept that your driver is in complete control at all times, and isn't suddenly going to demonstrate the fine art of driving upside down. One can also see how addictive drifting could be. Driving home on the A303, it's all I can do to keep end on.

Word list :

starboard	the right side of ship or aircraft (vehicle) as you are facing forward
rpm	rpm is used to indicate the speed of something by saying how many times per minute it will go round in a circle. rpm is an abbreviation for 'revolutions per minute'.

BSM	Business service management (BSM).
meekly	Quit, gentle, and not willing to argue or express your opinions in a forceful way
skidding	(especially of a vehicle) to slide along a surface so that you have no control
legitimate	Allowed by law
ethos	the set of beliefs, ideas, etc. about the social behavior and relationships of a person or group:
baffling	Impossible for someone to understand or explain.
ubiquity	The fact that something or someone seems to be everywhere
differentials	an amount of difference between things that are compared
disused	No longer being used
venues	the place where a public event or meeting happens
reluctance	an unwillingness to do something
Compulsion	a very strong feeling of wanting to do something repeatedly that is difficult to control
cacophony	an unpleasant mixture of loud sounds
perpendicular	at an angle of 90° to a horizontal line or surface

Summary :

The history of drifting is murky, but it is said to have evolved from a form of illegal hill-racing in Japan. In its country of origin, drifting has grown into a wholly legitimate sport. Although the top competitors drift through turns and straights at more than 100mph, speed has never been the point. It's about how sideways you are, and it's about style. Drifting, or "grip racing" as drifters call it, is rougher, readier and completely baffling to the traditionalist.

Drifting is starting to take off in Britain, according to John Chambers, who has set up Drift Academy to teach the basic skills of the sport. You can bring your own car if you like (virtually any rear-wheel drive vehicle can drift) or train in one of the Academy's Mazda MX5s, equipped with drift-friendly tires.

Link :

<https://www.theguardian.com/technology/2005/apr/19/1>

Are hydrogen fuel-cell cars the future?

Published: 19 October 2022

Tim Pollard

Article contents :

- The **viability** of hydrogen cars
- Pipe dream or The Next Big Thing?
- We look at fuel-cells and H2 cars

As the electric revolution redraws the automotive map at faster and faster pace, you'd be forgiven for thinking that battery electric vehicles (BEVs) have won the argument – and other forms of alternative fuel such as hydrogen fuel-cell electric vehicles (HFCEVs or FCEVs) have already lost. In reality, it's not quite such a **binary** discussion. Life is rarely black and white, and the future of fuelling cars isn't decided just yet.

Be in no doubt: some car manufacturers still believe that hydrogen fuel-cell vehicles could secure a place in a new, more fragmented future of the automobile. But so too could **synthetic** biofuels keep petrol and diesel **combustion** alive, while hybrids, autogas and other powertrains remain important considerations, as engineers explore multiple technologies in the quest to balance **decarbonization** with consumer need.

In this article, we discuss the **feasibility** of hydrogen cars and look at some of the opportunities and obstacles to their mainstream adoption. It asks: are fuel-cell cars the future?

How viable are hydrogen cars?

Automotive hydrogen fuel-cells have been around for decades and have long been caught in a chicken-and-egg situation. Can they launch before a valid infrastructure is ready? Or should a network of hydrogen refueling pumps roll out first, paving the way for widespread demand?

Long-time readers of *CAR* magazine will be familiar with the arguments around hydrogen in the automotive **firmament**. Our supplement *The Car In The Future* tackled the viability of H2 cars as long ago as summer 1990:

After sampling a hydrogen-powered BMW 7-Series prototype in Munich, our correspondent Roger Bell called it right: 'Hydrogen power is not just round the corner.' Over 30 years later, it's still not clear if the revolution is **imminent** or far off.

Fuel-cell cars you can buy today

Fast-forward three decades and there are only two hydrogen-powered cars on sale today in the UK – a brace of fuel-cell models geared towards corporate users likely to have bunkered hydrogen at their disposal.

The Toyota Mirai retails from £49,995 while the Hyundai Nexo (below) costs £69,495. Such lofty prices might explain why they have not yet taken off, but many

manufacturers persist with developing fuel-cell vehicles and believe that their myriad benefits are worth pursuing in a multi-fuel future.

Other carmakers still dabbling with the technology include BMW, Jaguar Land Rover, Mercedes-Benz and Renault – while Stellantis actually has a range of plug-in hybrid hydrogen vans on sale in Europe already.

There are even some performance concepts beginning to emerge, including the 2022 Alpine Alpenglow, a GR Yaris prototype with a hydrogen combustion engine, and an experimental BAC Mono.

What are hydrogen fuel cell cars?

Hydrogen fuel-cells are, fundamentally, electric cars – it's just a question of how they store their energy onboard where they vary from pure EVs. Herein lie the advantages and disadvantages of the H2 brigade:

Benefits of hydrogen cars:

- Clean tailpipe emissions (only emissions are water)
- Ability to refuel as quickly as a petrol or diesel car
- Potentially longer range than current battery tech allows
- Avoids need for heavy and bulky batteries onboard
- Proven technology, mechanically simple

Disadvantages of hydrogen cars:

- Patchy refuelling infrastructure (just 11 H2 stations open to the British public in early 2022)
- Technology still expensive – pricier than battery electric vehicles
- Fuel-cells not as efficient well-to-wheel as BEVs
- Cleanliness depends on how hydrogen is produced

That last point is a fundamental one often overlooked in the fuel debate: how hydrogen is created dictates its cleanliness. Prepare to dust down your scientific

rainbow as we consider 'brown hydrogen' (created through the **gasification** of coal or lignite), 'grey hydrogen' (produced by steam methane reformation using natural gas), 'blue hydrogen' (steam methane reformation, cleansed by carbon capture and storage) and 'green hydrogen' (made by electrolysis of water powered by renewable energy).

Discussion around **automotive** hydrogen becomes more compelling when green hydrogen is on the table. A new £240 million government Net Zero Hydrogen Fund (NZHF) is being established to promote the production of low-carbon hydrogen in Britain – it's worth watching specialist firms such as ITM Power, Johnson Matthey and Ceres Power who are pioneering clean hydrogen here.

Will hydrogen fuel-cells ever take off?

Many western countries would need to **pivot** their energy supply dramatically to make hydrogen a viable mass transport fuel. The UK doesn't have enough infrastructure today to make widespread adoption likely, but that could change given long-range investment and direction from government and industry.

The UK Hydrogen Strategy was published in summer 2021, setting out the government's target to produce 5GW of clean hydrogen by 2030. A hydrogen economy that backed H₂ for certain specific tasks – like fuelling the **haulage** sector, some buses, automobiles and even domestic boilers – is on the cards as Britain prepares to hit net zero by 2050.

The white paper spells out the future for hydrogen in the UK: 'We expect that the role of hydrogen in transport will evolve over the course of the 2020s and beyond. To date, road transport has been a leading early market for hydrogen in the UK. Going forward, we expect hydrogen vehicles, particularly depot-based transport including buses, to **constitute** the bulk of 2020s hydrogen demand from the mobility sector. Fuel-cell hydrogen buses have a range similar to their diesel counterparts.

Back-to-depot operating means hydrogen refueling infrastructure can be more centralized and is likely to be compatible with distributed hydrogen production expected in this period.'

But what about hydrogen cars? Or is H2 only going to power commercial vehicles?

Politicians predict that hydrogen will be focused on heavy goods vehicles. 'We will undertake a range of research and innovation activity which will focus on difficult to decarbonize transport modes, such as heavy road freight. As we demonstrate and understand these larger-scale applications, we are likely to see more diversity in transport end uses in the late 2020s and early 2030s. By 2030, we envisage hydrogen to be in use across a range of transport modes, including HGVs, buses and rail, along with early stage uses in commercial shipping and aviation. Our analysis shows there could be up to 6TWh demand for low-carbon hydrogen from transport in 2030.'

Tellingly, even the government's own white paper doesn't foresee scaled take-up among private motor car users. But that won't stop more globally enlightened car makers giving it their best shot.

You've just got to hope that the policy makers shaping the country's infrastructure are on the same page as the industrialists planning the next generation of cars.

Word list :

viability	ability to work as intended or to succeed
binary	relating to or consisting of two things, in which everything is either one thing or the other
synthetic	Synthetic products are made from artificial substances, often copying a natural product

combustion	The process of burning
decarbonization	the process of stopping or reducing carbon gases, especially carbon dioxide, being released into the atmosphere as the result of a process, for example the burning of fossil fuels
feasibility	the possibility that can be made, done, or achieved, or is reasonable
firmament	The sky
imminent	coming or likely to happen very soon
myriad	a very large number of something
Tailpipe	the pipe at the back of a vehicle through which waste gas escapes from the engine
gasification	Gasification is a process that converts biomass- or fossil fuel-based carbonaceous materials into gases,
automotive	relating to road vehicles
pivot	a fixed point supporting something that turns or balances
haulage	the business of moving things by road or railway
Constitute	to be or be considered as something
aviation	the activity of flying aircraft, or of designing, producing, and keeping them in good condition

Summary :

Hydrogen fuel-cell electric cars have been around for decades, but are they the future of motoring? We look at some of the opportunities and obstacles to their mainstream adoption. Can they launch before a valid infrastructure is ready Or should a network of hydrogen refueling pumps roll out first? Hydrogen fuel-cells are, fundamentally, electric cars – it's just a question of how they store their energy onboard, where they vary from pure EVs.

The UK doesn't have enough infrastructure today to make widespread adoption likely, but that could change given long-range investment and direction from government and industry. Hydrogen could be in use across a range of transport modes, including HGVs, buses and rail. There could be up to 6TWh demand for low-carbon hydrogen from transport in 2030. Even the government's own white paper doesn't foresee scaled take-up among private motor car users.

Link :

<https://www.carmagazine.co.uk/electric/are-hydrogen-fuel-cell-cars-the-future/>

How driverless cars will change our world

By Jenny Cusack 30th November 2021

Article contents :

Self-driving vehicles are steadily becoming a reality despite the many **hurdles** still to be overcome – and they could change our world in some unexpected ways.

It's a late night in the Metro area of Phoenix, Arizona. Under the **artificial** glare of street lamps, a car can be seen slowly approaching. Active sensors on the vehicle **radiate** a low hum. A green and blue 'W' glows from the windshield, giving off just enough light to see inside – to a completely empty driver seat.

The wheel navigates the **curb** steadily, parking as an arrival notification pings on the phone of the person waiting for it. When they open the door to climb inside, a voice greets them over the vehicle's sound system. "Good evening, this car is all yours – with no one upfront," it says.

This is a Waymo One **robotaxi**, hailed just 10 minutes ago using an app. The open use of this service to the public, slowly expanding across the US, is one of the many developments signalling that driverless technology is truly becoming a part of our lives.

The promise of driverless technology has long been **enticing**. It has the potential to transform our experience of **commuting** and long journeys, take people out of high-risk working environments and **streamline** our industries. It's key to helping us build the cities of the future, where our **reliance** and relationship with cars are redefined – lowering carbon emissions and paving the way for more sustainable ways of living. And it could make our travel safer. The **World Health Organization estimates** that more than 1.3 million people die each year as a result of road traffic crashes. "We want safer roads and less fatalities. Automation ultimately could provide that," says Camilla Fowler, head of automated transport for the UK's Transport Research Laboratory (TRL).

But in order for driverless technology to become **mainstream**, much still needs to change.

"Driverless vehicles should be a very calm and serene way of getting from A to B. But not every human driver around it will be behaving in that way," says David Hynd, chief scientist for safety and investigations at TRL. "It's got to be able to cope with human drivers speeding, for instance, or breaking the rules of the road."

And that's not the only challenge. There's regulation, rethinking the highway code, public **perception**, improving the **infrastructure** of our streets, towns, cities, and the big question of ultimate **liability** for road accidents. "The whole insurance industry is looking into how they're going to deal with that change from a person being responsible and in charge to the vehicle doing that," says Richard Jinks, vice president of commercial at Oxfordshire-based driverless vehicle software company Oxbotica, which has been testing its technology in cars and delivery vehicles at several locations across the UK and Europe.

The ultimate vision experts are working towards is of completely driverless vehicles, both within industry, wider transport networks, and personal-use cars, that can be deployed and used anywhere and everywhere around the world.

But with all these hurdles in place, what exactly does the next 10 years have in store for autonomous vehicles?

Two years from now

The biggest hurdle for those in the driverless technology industry is how to get the cars to operate safely and effectively in complex and unpredictable human environments. Cracking this part of the puzzle will be the major focus of the next two years.

At the **Mcity Test Facility** at the University of Michigan, experts are addressing this. The world's first purpose-built testing ground for autonomous vehicles, it's a mini-town of sorts, made up of 16 **acres** of road and traffic infrastructure. It includes traffic signals and signs, underpasses, building facades, tree cover, home and garage exterior for testing delivery and **ride-hailing**, and different terrains such as road, pedestrian walkways, railway tracks, and road-markings which the vehicles must navigate. It's here that experts test scenarios that even the most experienced of drivers may be pressed to handle, from children playing in the street to two cars trying to merge on a **junction** at the same time.

"In order to test driverless technology like this, it depends on hundreds of different variables in any given situation," explains Necmiye Ozay, associate professor of electrical and computer engineering at the University of Michigan. Her solution is to create a group of varied thinkers.

"We're trying to bring people from different parts of the university – not only engineers, but we have people from across disciplines such as psychology, more human-machine-interaction type people, because there are lots of angles to this problem we are trying to solve when it comes to safety," says Ozay. In the facility, Ozay and her team can test different traffic scenarios, as well as explore how autonomous vehicles communicate with each other yet keep vehicle and personal data secure from hackers.

That self-driving taxis are already on the roads in Phoenix, Arizona, is due to a prolonged testing process like the one Ozay's team is conducting. Currently only available as a test service to the public in small defined areas, in the next two years

there are **plans** to release the taxis on a greater and wider scale. For example, US-based company Waymo is currently rolling out to new city test sites that could very realistically see robotaxis operational in San Francisco and New York by 2023. But their co-chief executive Tekedra Mawakana was cautious to say what further roll out of its service there might be, and where, **because "safety takes time"**.

AutoX, a start-up funded by Alibaba, launched its fully driverless RoboTaxi in Shanghai, China in 2020. By 2023 it's likely their service will be available in **other cities across China, as well as in California**.

Much of the driverless technology already in use exists in industrial settings like mines, warehouses, and ports, but Hynd believes in the next two years we can expect to see this extended to "last mile delivery". This means the final part of a journey for goods and services – the point at which they are delivered to the consumer. For example, autonomous HGV trucks on motorways or even delivery vehicles for products and groceries.

Five years from now

While **Apple says** it is aiming to launch fully self-driving electric cars four years from now, industry experts are more cautious about what the near-future holds.

According to Fowler, the conversation around **regulation** and insurance companies' new role within this transport space needs to mature. "It's got to be a very iterative approach where we're starting with pods and shuttles, or we're starting with off-highway vehicles where you can see such a benefit, and you've got a more controlled environment potentially, and what works with that," she says. "Then we can scale it up and across more vehicle types, more use cases."

One new space we can expect to see driverless technology deployed in is high-risk environments, from nuclear plants to military settings, to limit the dangers to human life, says Fowler. A Rio Tinto mine in Western Australia, for example, is currently operating the **largest autonomous fleet in the world**. The trucks are controlled by a centralised system miles away in Perth.

"If you can take people out of that and you can have vehicles that are driving themselves, and are fully automated even, if you've got somebody who's remotely needing to control that vehicle in that high-risk environment then that's got to be good," says Fowler.

In the next five years most driverless technology will remain behind the scenes. TRL is investigating the potential for driverless HGVs on motorways, including the idea of **platooning** vehicles. Platoons are a group of semi-autonomous vehicles that drive a close distance between each other, stopping other vehicles from separating them. By driving closer together, vehicles in a platoon can be more fuel efficient by taking advantage of the **slipstream** of the truck in front while also helping to reduce congestion as the lorries take up less overall space on the road. Also in this space is **Plus**, the first self-driving truck manufacturer, whose European pilots commenced this year after a successful trial on Wufengshan highway in China's Yangtze Delta economic centre.

Away from these industries, Ozay further predicts that "we will possibly see lighter robotic vehicles that can potentially use sidewalks and bike paths with limited speeds – for delivering things such as food and groceries."

When it comes to public transport, Oxbotica is also working with German-based vehicle systems specialist ZF over the next five years to make the **driverless shuttle** a true mainstay for European cities, operating on roads, as well as at airports, much in the same way buses do now. "The shuttles in airports we see today on rails won't need those rails in five years from now. This means driverless shuttles have the potential to transport you from the car park to the airport, then straight through to your gate and the plane," Jinks explains.

For users, this could mean more reliable and cost-efficient transport systems. "Interlinking autonomous transport systems to bring a public transport system that is as efficient as you jumping in your own car and driving it yourself has got to be the answer to congestion in the future," adds Jinks.

Seven years from now

All experts agree that the next seven years will depend on the successes and failures of initial deployments, and how safety and public trust evolves accordingly. However, most hope that city redesigns will enable more adoption of the technology and help move us into modern, and more efficient ways of living. "If you live in a dense, urban area, the hope is that you'd be able to rely on mobility as a service. You could dial up the car, it would arrive in two minutes, and you make your journey. You wouldn't need to have those vast rows of parked cars in your street, which makes the street more navigable for the automated vehicle," says Hynd.

Without parked cars lining the street, roads could be narrower, making way for more green spaces. But while proponents of self-driving vehicles insist they will make our roads safer, there are some who feel **pedestrians and autonomous vehicles simply can't mix**. It could mean that our cities and the way we use them may need to be reimaged.

Some of this thinking is already taking place. In 2018, IKEA developed a **concept autonomous vehicle** that can double up as meeting rooms, hotels, and stores. The impact this type of innovation would have is reduced requirement for travel in the first place, offering instead interchangeable, on-demand environments as and when we need them. Our needs could be met right where we are.

Ozay expects many more self-driving options to be available for customers during this time, including in the passenger vehicle space. "My hope is that cars will be smart enough to say 'yes' or 'no' when asked if they can reliably and safely get a non-driver from point A to point B on a given day, by analysing the weather and traffic conditions beforehand," she explains.

10 years from now

Despite all the developments and innovations the next decade is likely to hold, some experts still feel we might be a way off from full deployment of driverless vehicles. By 2031, "full-self driving – human-level or above, in all possible conditions, where you can put kids by themselves in the car to send them to arbitrary locations without worrying – is not something I expect to see," says Ozay.

Hynd agrees that full automation is unlikely on this timescale. "With anything transport infrastructure, anything that society uses, so many other things need to come into play. And I don't just mean regulation," he says. Safety will be a major hurdle, especially for countries slower to adopt the change because of the huge costs involved. Infrastructure will also dictate how fast and effectively this technology can roll out, and public perception and willingness to use autonomous vehicles will need to increase according to Hynd.

But not everyone agrees. Jinks is confident that we'll see autonomous vehicles on the roads at the same time as human-driven vehicles in 10 years from now. In this vein, you may very well be stepping onto a driverless shuttle at the airport, then into a self-driving taxi to take you to your final destination.

Owning a driverless car in the next 10 years is less likely – it'll still be too expensive for most people, according to Hynd. But the promise of driverless technology is about unchaining us from our **reliance** on cars, and how that can transform the use of our time and our environment.

"This is one of the biggest engineering problems that we're trying to solve in a century," Jinks says. "It will be an evolution over time from less complex environments and capabilities, to more complex, to everywhere. It's a **continuum**, and think about that continuum... It will keep improving over time. These things will continuously learn from each other."

Much in the same way that electric charging stations have slowly entered car parks, side streets, and service stations, so too will autonomous vehicles eventually make their way into our everyday worlds. Years from now, we may well be wondering how we ever lived without them.

Word list :

Hurdles	Obstacles or difficulties that must be overcome in order to achieve something.
---------	--

Artificial	Made or produced by human beings, especially by means of technical or scientific processes.
Radiate	Emit energy, heat, light, or sound in the form of rays or waves.
Curb	A raised edge along the side of a road, used to prevent vehicles from driving off it.
Robotaxi	A taxi that is self-driving, or operated by a robot.
Commuting	The action of traveling regularly between one's place of work and home.
Streamline	Make (a process or organization) more efficient and effective by eliminating unnecessary steps.
Reliance	The fact or condition of relying on someone or something for support, help, or supply.
Mainstream	Conforming to the most widely held beliefs or values within a society.
Perception	The ability to see, hear, or become aware of something through the senses.
Infrastructure	The basic physical and organizational structures and facilities (e.g. buildings, roads, and power supplies) needed for the operation of a society or enterprise.
Liability	The state of being legally responsible for something.
Acres	A unit of land area in the US and UK, equal to 4,046.8564224 square meters.
Ride-hailing	A transportation service in which a passenger uses a smartphone app to request a ride from a private vehicle driver.
Junction	A place where two or more roads meet, typically one that allows a driver to change direction.

Regulation	A rule or directive made and maintained by an authority.
Slipstream	The area of reduced air pressure behind a moving vehicle, especially a racing car, that can be used by a following vehicle to reduce drag and increase speed.
Driverless shuttle	A self-driving vehicle that is used to transport people or goods, usually within a limited area.
Continuum	A continuous sequence or extent, in which adjacent elements are not perceptibly different from each other, but the extremes are quite distinct.

Enticing	Attractive or tempting.
----------	-------------------------

Summary :

Self-driving cars could transform our experience of commuting and long journeys. They could also take people out of high-risk working environments and streamline our industries. But much still needs to change in order for driverless technology to become mainstream. The Waymo One robotaxi service is being rolled out across the US. The Mcity Test Facility at the University of Michigan is the world's first purpose-built testing ground for autonomous vehicles. It's a mini-town made up of 16 acres of road and traffic infrastructure, with terrains such as pedestrian walkways, railway tracks and road-markings. Self-driving taxis are already being trialed in Phoenix, Arizona, but the company behind them, Hynd, has just opened a new test facility. In the next two years, there are plans to release them on a wider scale across the US and China. This is the point at which goods and services are delivered to the consumer, rather than being transported by trucks and lorries on motorways or inter-city transport like HGV trucks today. Oxbotica is investigating the potential for driverless HGVs on motorways, including the idea of platooning vehicles. Plus is the first self-driving truck manufacturer, whose European pilots commenced this year after a successful trial on Wufengshan highway in China's Yangtze Delta economic center. IKEA has developed a concept vehicle that can double up as meeting rooms, hotels, and stores.

Link :

<https://www.bbc.com/future/article/20211126-how-driverless-cars-will-change-our-world>

Why car dealers may face a bumpy road ahead

- Published
- 1 day ago
-

By Jonty Bloom

Article contents :

Reporting

Why do so many of us think we can successfully haggle over the price of a new car with a professional salesman?

After all, it's not like they do it for a living, or are trained, or have decades of experience, is it?

But things are changing on the **forecourt**. UK car dealerships, currently still mostly independently owned **franchises**, are facing a number of threats.

The coronavirus pandemic was the driving force behind an already existing trend that is now rapidly changing the car industry.

Instead of visiting one of the 4,500 car showrooms across the UK, or even several, test driving the vehicle, then picking a car and **haggling** with the sales team, customers are increasingly trying something new.

These days people are far more likely to search online for the car they want, picking two or three to look at. They then only visit the showroom to make their final choice and, perhaps, try to get some discount on the price advertised online.

"If anything the pandemic accelerated this," says Christian Stadler, professor of strategy at Warwick Business School. "It is a light, easy way into the online world for customers.

"You find your vehicle on the website of the big car company, you trust its brand, but you still get it delivered through some local sales point, you can meet someone when you get the car."

However, Sue Robinson, chief executive of the National Franchised Dealers Association, begs to differ. She points out that "people still like to go to the showroom, and on average make 3.1 trips there before buying a new car".

But the number of visits to showrooms before purchasing a car is falling. People shop around online far more and are, therefore, far less influenced by the sales staff.

This new **hybrid** model of buying, where you first look online and then go to a showroom, is increasingly popular. It was exactly how I bought my new car last year. My wife and I researched what type of car we wanted, picked out the perfect model, and then searched for the second-hand example that we could afford that was on sale near us, and we did all that online. Only then did we visit a showroom, check out the car, go for a test drive and make a decision to take the vehicle home with us.

We could have gone further, because 10% of UK sales are now said to be completed totally online, with the buyer not seeing the car until it is delivered to his or her doorstep.

These sales are lost to the car showroom owners, and this new buying method is here to stay.

So too is the move towards electric vehicles. Purely electric and plug-in hybrids now make up 20% of all new cars, and that proportion can only increase in the coming years.

Not only has the massive **hike** in fuel prices encouraged this trend, but new petrol and diesel car sales will be banned in the UK by 2030. That means dealerships will have to spend money retraining their staff to repair and maintain electric and hybrid vehicles.

And since electric vehicles have far fewer moving parts it should mean they need less servicing.

This too may pose a threat to the traditional car dealership, says Professor Stadler. "If servicing is less of an issue then the relationship with the dealership may become less important.

"There could be more of a separation between dealer and servicing. Now we buy a car and get it serviced and repaired at the same place. That might separate in future."

But Robert Forrester is not that convinced by that argument. He is chief executive of Vertu Motors, which has 160 dealerships selling cars for BMW, Audi, Nissan, Ford and several others. It has 4% of the new car market in the UK and employs 6,500 people.

As he points out, the cars of today might need less servicing but they can no longer be serviced at home. "The only people who will be able to repair and fix cars going forward will be the franchise dealer, who has the expertise to do it," he says.

Whoever is right, the move towards servicing electric vehicles will be a game changer for the industry. The need to retrain staff will accelerate and dealers who don't invest in the latest technology will lose out.

The independent dealerships are also coming under pressure from some of the car manufacturers deciding to do away with such franchises, and instead open their own company-owned and run showrooms.

Tesla, which has the advantage of being a new entrant into the market, has adopted this direct-selling model from the very start.

Two other carmakers are now also opening directly owned showrooms - Audi and DS. And others, including VW, Audi and Mercedes, are rumoured to be thinking about following suit.

Franchise owners have in the past made about 7% profit on every car they sold, but the car firms are said to now think that is too generous, and want some of that money back.

"There are some carmakers who are a long way along [the journey to owning their own dealerships], and others are waiting to see whether it works," says Ms Robinson.

Although taking over the dealerships means taking on the costs of property, staff and promotion, the carmakers get to sell their product at a set price of their choosing. They won't have to offer discounts to dealers to shift stock, and it gives them other advantages as well.

"It gives you more data, and if you have your hands directly on the sales you get a better sense of what the customers are doing," says Prof Stadler.

In coming years that data will become increasingly important as the way people own cars is likely to change.

In the future cars may be regarded more as "mobility solutions", something to hire for limited periods, rather than something to buy. This would give you, for example, the chance to swap your city runaround for a bigger car during the holidays, or take out a **convertible** for the weekend.

There could be car clubs, or paying by the hour or mile. All of that becomes far easier if the car companies have your data and can use it to fashion a deal that works for you, and them of course.

At Vertu Motors Robert Forrester is not worried, however. He says the car manufacturers will still need salesrooms and sales people, but they will be paid a flat rate by the carmaker rather than trying to make a profit on every car sale.

He adds the only difference customers will notice is that "the invoice will come from the manufacturer not the retailer".

But it could well mean less room to **haggle**, and less competition between showrooms selling the same brand and model. Haggle while you can, it may not be an option for much longer.

Word list :

Forecourt	the area in front of a building, especially a church, or the area in front of the entrance to a station, airport, etc.
Franchise	a right granted to an individual or group to sell a company's goods or services within a particular territory or market
Haggling	the act of arguing or bargaining persistently, especially over the price of something
Hybrid	a thing made by combining two different things
Hike	an increase in the cost of something. It can refer to a sudden or unexpected increase, or a gradual increase over time
Convertible	a vehicle, such as a car or truck, that can be converted from an enclosed to an open vehicle or vice versa
Haggle	to argue or bargain persistently, especially over the price of something.

Summary :

Car dealerships, currently still mostly independently owned franchises, are facing a number of threats. The coronavirus pandemic was the driving force behind an already existing trend that is now rapidly changing the car industry. People shop around online far more and are, therefore, far less influenced by sales staff. Ten per cent of UK car sales are now completed totally online, with the buyer not seeing the car until it is delivered to their doorstep. Electric and plug-in hybrids now make up 20% of all new cars, and that proportion can only increase in the coming years. The move away from franchising means they no longer have to make a 7% profit on every car sold.

Link :

[Why car dealers may face a bumpy road ahead - BBC News](#)

Porsche 911 GT3 RS and Cayman GT4 RS head to head – which is best?

Where better than the Top Gear test track to pit two incredible Porsche RS cars against each other?



Ollie Marriage

Article contents :

Published: 19 Dec 2022 5 comments

The GT3 RS is **full-on**. **Limb shakingly physical**, brain **gaspingly** demanding, it's a car you have to **limber up** for. Shrug your shoulders, flex your fingers, roll your head around on your neck, do what you like. Prepare. But you're still going down.

There's not much else like it. The McLaren Senna, that's the car people mention, but I'm not sure even that feels as physical and urgent as you peel into a quick corner as this does. Modern supercars lack edge. I've said it myself, that they place speed and capability over involvement. Well done Porsche, for setting me straight. Because the GT3 RS is ballistic, a car with utter, stark staringly furious focus on attack, attack, attack. It's all it knows. I dread to think what it's like on road. Pretty bloody horrid, I suspect.

Haven't got the spare neurons to think about that right now, because the rear tyres are super-heated to 70°C, the carbon ceramic brakes are glowing, the **battered air** is left trembling and the GT3 RS is delivering a **riotous** smackdown, clawing demonically into the **tarmac**, **bludgeoning** me until I'm punch-drunk. It's hectic. It's busy. It's super stiff and moves around, skips and fidgets, argues and fights. It belittles me. I feel cuckolded. "Get me a proper driver," it screams, "One who won't wince and pucker through Follow Through." Where's The Stig when you need him?

I've been rattling the memory banks but I can't think of a production road car I've driven that comes closer to aping a racing car. To genuinely behaving like one in its **mannerisms** and methods. Don't get me started on its **snatchy**, irritable, grumpy behaviour when the brakes and tyres were cold. And even now as it's itchy as it skims over Dunsfold's innumerable bumps, dips and troughs.

I didn't time it because that's Stig business, but it did go through Follow Through at 114mph. I tried the same trick in the GT4 RS and had a massive, massive moment at 95mph. It let go in a big way where the GT3 RS had shrugged and gone "is that all you've got?" while travelling 20mph faster. Mad.

And that one moment encapsulates the difference between these two. Over 400kg of downforce at 124mph from a wing that must have troubled all legislative and regulatory rulebooks, plays whatever flaccid excuse for a spoiler that is that dwells on the GT4 RS's rump. Until the GT3 RS came along we cooed over it. Now it looks, well... proportionate.

I haven't talked about engines and performance. The GT3 RS can take everything the 4.0-litre flat six can offer, wherever you choose to offer it. You have direct differential and damping control to maximise that, and as a result it's not just the GT3 RS's apex speed, but its traction out the far side that distinguishes it from the GT4 RS.

It's the same engine in the Cayman, only about 25bhp down (and 35kg down, too). It's barely any slower in a straight line and when it comes to noise, the GT4 RS is where it's at. Those carbon intake snouts behind the doors are black holes, ripping air into their dark depths over the event horizon. It's a snarl of such savagery and 9,000rpm crescendo, gear after gear that you never want to lift off. It sounds like the GT3 RS feels.

To drive the GT4 RS is notably softer and more forgiving. We never said that at Speed Week when it was in the company of the Ferrari 296 and McLaren Elva. There it felt taut as a tendon, here I can feel squidge. I've decided I like squidge, especially when it's this well controlled and the balance as you brake and turn is so good. That's the difference between these two – the GT4 RS is flattering, its mid-engined balance is more natural and understandable.

As well as bravery, the GT3 RS requires technique and understanding, an ability to use the rear engine to get the most from the car. That's always been the case with 911s, but here such is the delicacy and precision of its responses that it's like you've accessed whole new levels. Smooth tracks it must just monster, bumpy ones take guts, commitment, ability and intelligence.

And the brakes! Only two cars we've ever tested have stopped faster. Another Porsche, the mighty 918 Spyder, and McLaren's 720S. This, stopping from 100mph in 74.6 metres and pulling a peak of over 2g, bettered everything from a McLaren P1 to a Ferrari SF90.

A word on value. For the experiences and abilities these two offer, they're bargains. Both are utterly captivating to drive, cars that set new standards for track focus and road engagement. You know which is which. Pay £178,500 for a GT3 RS and you

would have to add all the racing bits. Call it £210k. For £113,700, the GT4 RS is one of the great bargains of our time. It doesn't need the cage and magnesium wheels. I'd drive it over any hypercar. I'd have it over the GT3 RS...

Word list :

Full-on	intense or complete.
Limb shakingly physical	physically demanding or intense enough to cause one's limbs to shake.
Limber up	stretch and warm up one's muscles before exercise or physical activity.
Battered	damaged or worn by hard use.
Riotous	chaotic or unrestrained.
Tarmac	a surface made of asphalt, typically used for roads or airstrips.
Bludgeoning	to strike or hit violently and repeatedly.
Mannerisms	are the ways in which a person behaves or speaks that are peculiar to them and distinguish them from others.
Snatchy	jerky or unstable.
Shrugged	to lift and lower one's shoulders to express disbelief, doubt, or lack of concern.
Legislative	to the process of making or enacting laws.
Flaccid	weak, flimsy, or lacking in firmness.
Taut	tightly stretched or strained.

Summary :

Porsche's new GT3 RS is full-on. Limb shakingly physical, brain gaspingly demanding, it's a car you have to limber up for. It's super stiff and moves around, skips and fidgets, argues and fights. Modern supercars lack edge, they place speed

and capability over involvement. It's the same engine in the Cayman, only about 25bhp down (and 35kg down, too).

It's barely any slower in a straight line and when it comes to noise, the GT4 RS is where it's at. It's a snarl of such savagery and 9,000rpm crescendo, gear after gear that you never want to lift off.

Link :

[Porsche 911 GT3 RS and Cayman GT4 RS head to head – which is best? | Top Gear](#)