A DATA STUDY BY 7TH SENSE RESEARCH

Driving *the* Future 02

v2.0 2020 Report

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Driving *the* Future 02

Introduction

Like the rest of the world the transport sector has shifted massively during lockdown, but how much of this is here to stay and what will the long term effects be?

Last year we researched Driving the Future and for this follow-up we again surveyed 3,000 UK transport users to ask: what's happening now, how have things changed and what will they be doing in the future?

Major change should come as no surprise – even before lockdown – however, we found some unexpected results, detailed in this year's Driving the Future, which will have much deeper long-term causes and effects than COVID-19. This is not a study about the pandemic, but it is of course impacted by it. As economies slowly recover, will we see a return to previous traffic levels and to previous use and demand for transport?

Our study suggests not. We believe that while this pandemic has been truly tragic for many tens of thousands of people, and it will continue to devastate lives and communities round the world, it has accelerated change in the lives of many others. For better or worse, we are in the midst of a transport revolution.

To help understand the complexity and granular nature of the results, we've split the report into three sections: Transport Use, Attitudes to Autonomy and We're only Human After All.

The first section looks at the revolution taking place in the UK's transport habits, and how post-COVID mobility will see significant changes in use and demand, while the second questions the public's acceptance of autonomous technology and if it should be considered a viable business opportunity. The final part finishes with the most important component in the equation, the nuts that are holding the steering wheels, humans. Do we really want cars, per se and if so, why are they important?

Working with specialist automotive PR agency loop we want to discuss these issues so the industry can quickly adapt, and this study can help OEMs, transport providers, governments and planners see how public perception will drive demand for the foreseeable future.

Fergus McVey
CEO, 7th Sense Research UK

v2.0 2020 Report
#01 Transport Use

Welcome to our report that will discuss how recent events have accelerated change in the mobility of society

7th Sense Research UK is a Consumer and Markets Insights agency based in London UK, which has quickly built a formidable reputation for helping clients understand market landscapes and consumer behaviours - especially where the situation is niche, complex or ground-breaking.

loop

loop is a specialist agency designed from the ground up to meet the evolving PR needs of the automotive industry. Its talented and award-winning team works with every size of business, from start-ups through to market leaders.

There are various descriptions of what age brackets fit which 'Generation' for this survey, so we have followed the Pew Research Centre's description:

- Gen-Z. Born between 1997 and 2012, those aged eight to 23
- Millennial: Born 1981-1996, ages 24-39
- Generation X: Born 1965-1980, ages 40-55
- Baby Boomers: 1946-1964, 56-74 years old
- Silent Generation: 1928-1945, 75+

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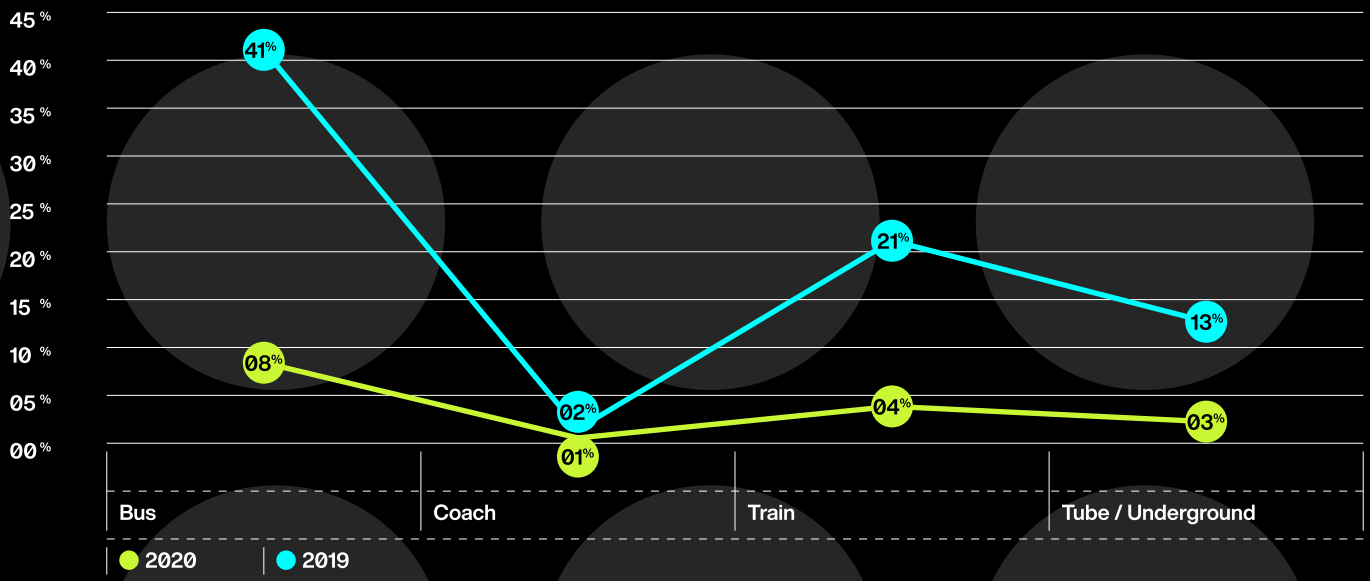
#01 Transport Use

A

Current transport use

All transport use has, of course, dropped dramatically since last year, and the use of public transport has suffered the most. This is not only due to the public being advised to stay at home and people being worried about travelling on public transport – masks notwithstanding – but particularly for trains, this is due to reduction in services and capacity on those services. People just can't get the train.

Public transport use 2019 – 2020



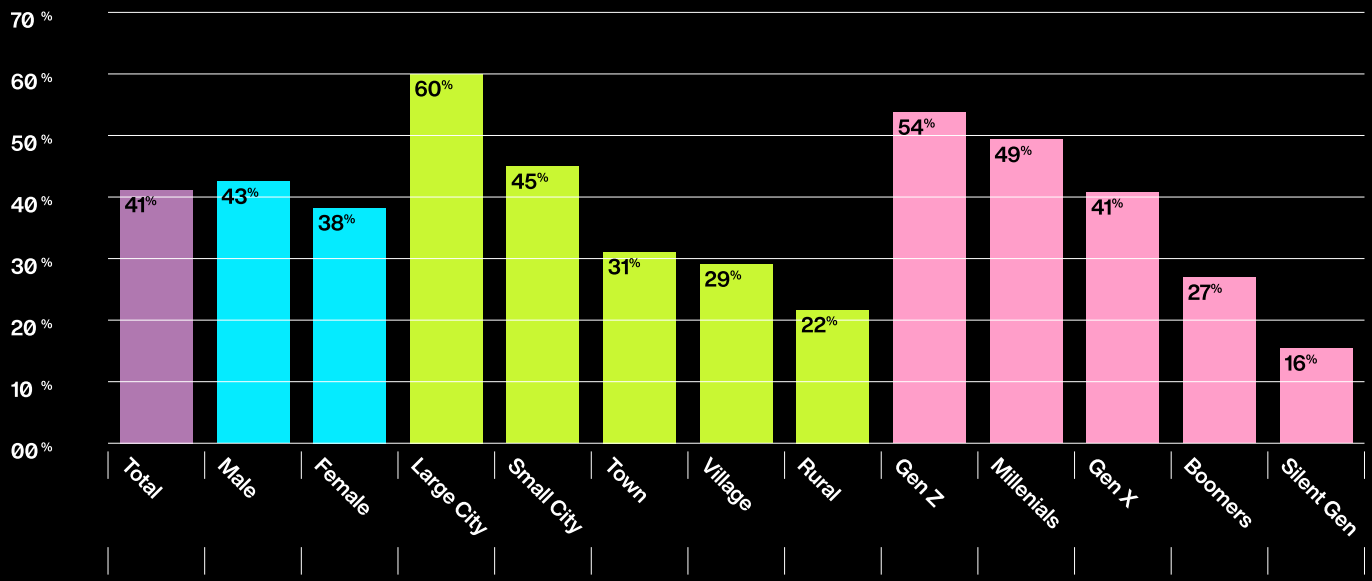
B

Long term transport use

60% of large city commuters will rethink their transport (70% are more cautious about public transport). This is being led by Gen-Z and to a lesser extent Millennials: they have yet to make sticky habits.

If they move on from how they were commuting, why would they come back?

Workers rethinking their commute



Half of all respondents will change how they use their car, but some will use it more, and some less. However, on balance 25% expect to use their car 'less' or 'a lot less' post-lockdown. This chimes with government data that currently shows a 25% drop in overall passenger car traffic from 100 Department for Transport urban monitoring sites (cit: *Guardian* Fri 10 July) (n.b. this is urban only, not yet post-pandemic, and overall passenger car volume, not % of drivers).

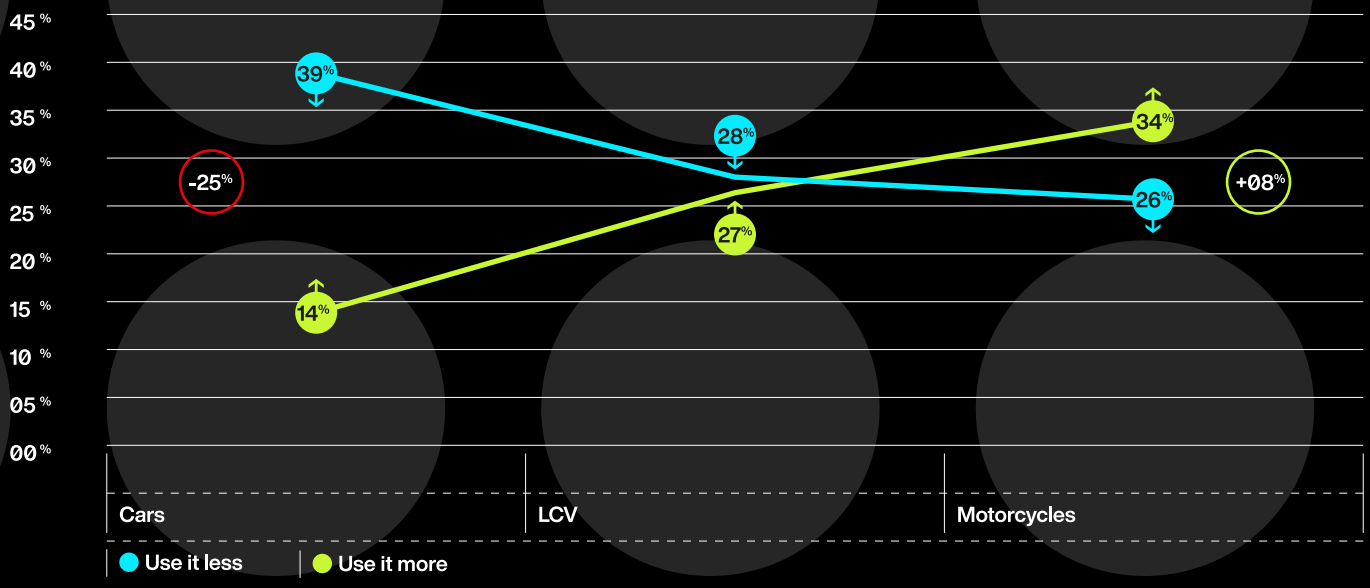
While we cannot expect that to remain the case indefinitely, people have found cheaper, easier, faster and more pleasant ways to do things: they are working from home (see below) and shopping online. They are not simply going to restart doing something that was so irritating to them in the first place. Van use seems to balance out with some increases in deliveries for owner drivers (excludes fleets) ameliorated by a drop off in expected work for trades and other uses. Two-wheeled transport on the other hand is a different kettle of fish.

Where we're going, do we need roads?

C

Personal Transportation

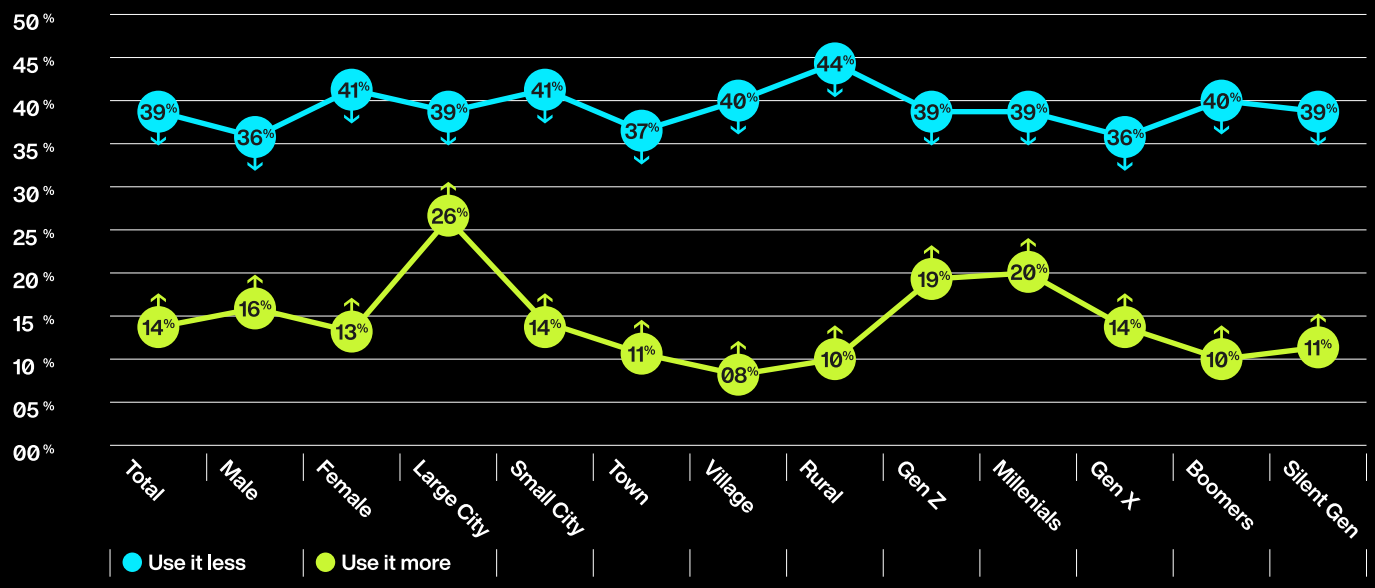
Vehicle use post lockdown



40% of motorbike owners in large cities will use them more. Bike, electric bike and scooter demand are all up, and overall, we see potential for a huge move to two wheels. This will impact both requirement for overall capacity and facilitation of modality: we won't need ever more space but the space we have will need to work for all kinds of users.

One in four of city dwellers will use their car more, but less than one in ten will in rural and village areas.

Car use post lockdown



In large cities where public transport was the default mode, many people feel forced to go back to the car, if they can't, or won't, get on a bus or the Tube. However, this is still offset by an overall drop in use such that we still see a 13% drop in people using their cars.

Elsewhere we see large, across-the-board drop offs in car use. Small cities will clearly change but the biggest change is in rural areas where, one might think, the choice is limited so people must use their cars as much as they need to. However, as with other areas, rural and villages also contain commuters who will just not drive to work (or the station) as much, while many people, having been forced into supermarket deliveries, are not planning to go back to driving miles to the shops.

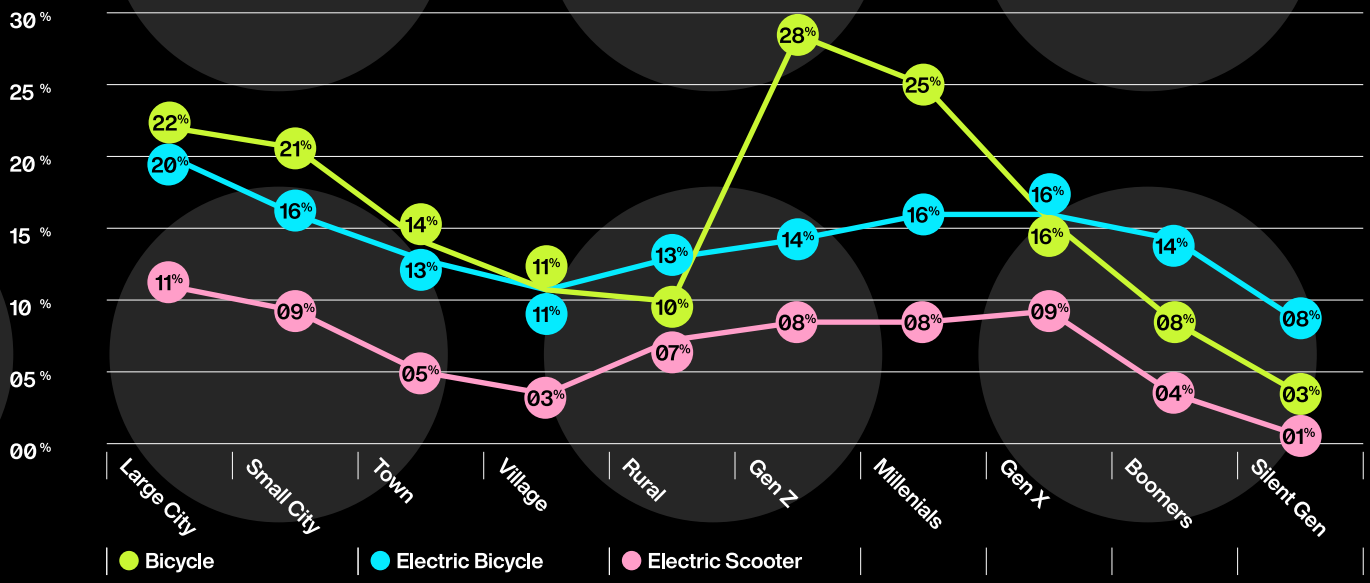
The impact is not just felt on the roads but on maintenance and replacement budgets. As the roads will inevitably wear out less quickly, will councils get them into better shape or divert funds to other much needed services? When the government is faced with huge losses from season ticket revenue – see below – will they divert funds from building roads into train operation to maintain service levels?

D

Two-wheeled revolution

So, what do people want and what does this mean for makers of other products?

Bicycle demand post lockdown



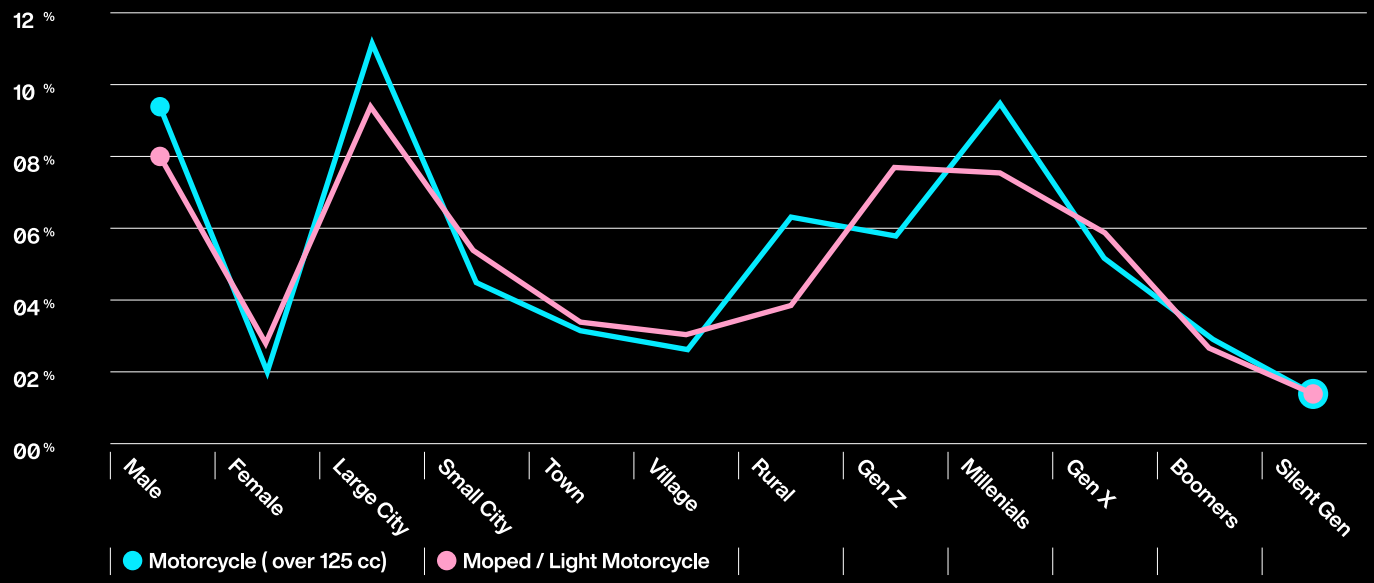
Despite stories of lack of supply as people scramble to buy bikes, it seems there is still a great deal of pent-up demand. Again, Gen-Z and Millennials are leading the charge in the two-wheeled revolution, surpassing the 'silent generation' who have either not had enough time to acquire the bike they want or maybe are not all that interested...

A look at city dwellers shows this is again about the types of use they would put a bike to. Around 1/5 of all city dwellers want to buy a bike post lockdown (rising to 1/4 of employed urbanites): they certainly don't seem to be planning to return to their old travel habits very soon.

Of course, this could be driven by an understandable yearning to get out and about to see some stuff. Nevertheless, it does highlight a substantial potential for bike manufacturers. It also serves as notice to city planners to ensure that the infrastructure that was put in place to help temporarily can handle an increase in demand as lockdown finishes, rather than a decrease if city dwellers return to their cars. Currently, it seems as if they don't think they will.

The electric scooter debate is being rushed along to aid the current situation but again, as our survey shows, there are a huge number of people in cities who are interested in an e-scooter post lockdown. We should not expect them to be a flash in the pan and again, the modality and capacity of city streets will have to be augmented to cope.

Motorbike demand post lockdown



But bigger, more powerful options are also popular. Motorbikes are also a very interesting prospect for people in cities – we saw already that current users plan to use their bikes a whole lot more, but we are also likely to see a bit of a sales surge for them as both mopeds and larger bikes show strong appeal for post-COVID lifestyle changes.

Gen-Z understandably tend to go for mopeds, but overall almost 12% of all city dwellers are interested in a larger motorbike. If it were converted to sales this would represent almost a doubling of current ownership. Manufacturers – and instructors – could be in for busy times ahead.

E

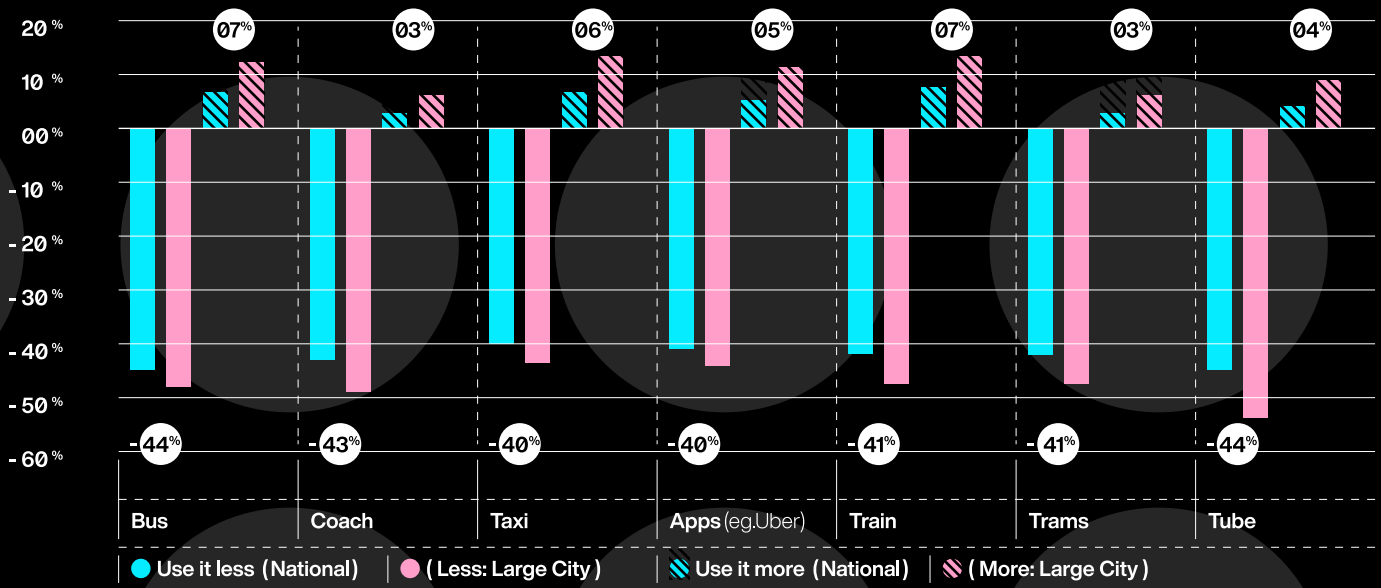
Public Transport

The key question for the rail industry is what does the market look like when they get back to a full timetable?

Will passengers be rushing back to the speed and comfort of rail, or the convenience and ubiquity of the Tube?

Well, not as much as before it seems:

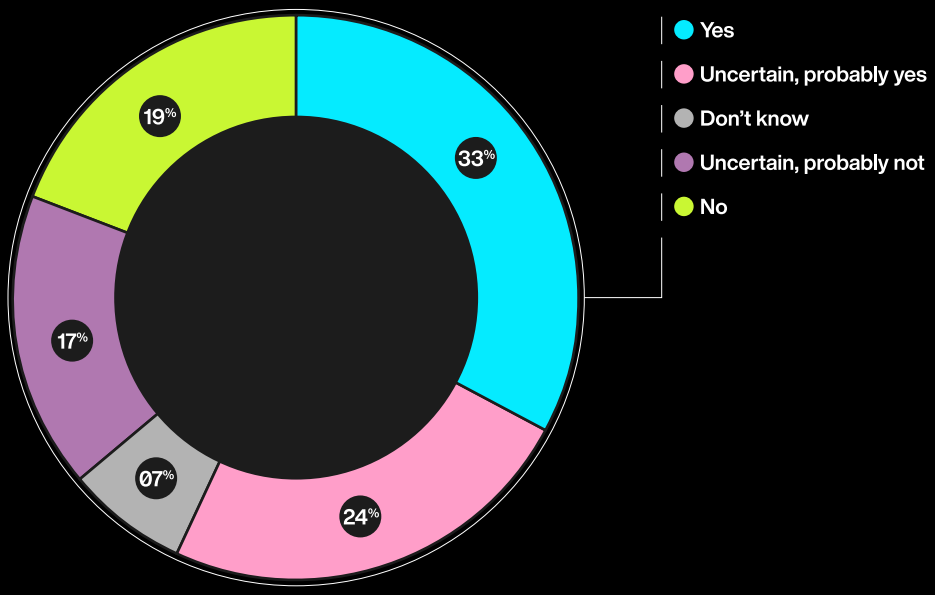
Post-lockdown public transport use



While some do think they will use public transport more, a massive majority think they will use it less, with an average of well over 1/3 less usage.

Clearly this could create more space on these services, but it would cause a significant downturn in revenue. Almost half of season ticket holders told us they weren't sure they would renew their season ticket or travelcard. We believe 43% of season tickets are 'in play' and at risk. Even taking away those who 'don't know', we are still left with people who say 'no', or 'probably not' when asked if they will keep their season ticket after lockdown.

Season ticket renewals after lockdown?



The implications are significant to say the least, with a reported £1.72bn in season ticket revenue.

Transport for London stands to lose £600m if it loses 36% of that revenue. Likewise, the rail industry could be hit by a shortfall of £750m. In order to maintain services extra revenue will have to be found, which of course means increased subsidy, but where will that come from? Roads and highways, which will have a reduced number of users and therefore will require less capacity and less maintenance, would appear to be an obvious target.

However, fare rises are not out of the question. Most respondents (58%) think fares will increase 'in the near future' with the expected rise on a £2 bus ticket being £0.62 and £2.75 on a £20 train ticket.

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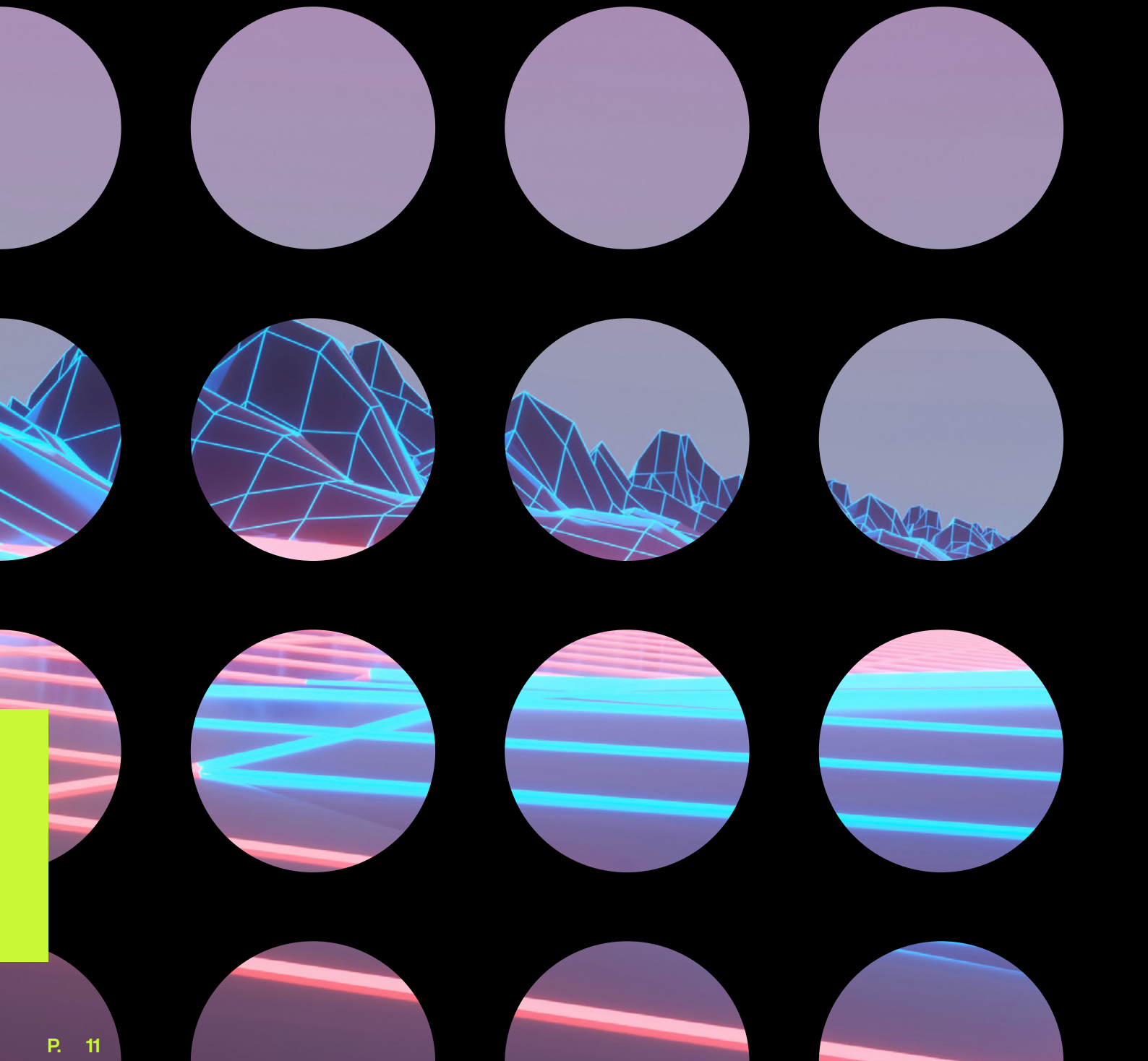
#01 Transport Use



Conclusion

While this study does signal a significant and fundamental shift in transportation demand it could still represent a significant opportunity for planners and engineers to develop, or redevelop, roads for a new modality.

We may still be some way off hoverboards for all but solving the e-scooter problem of shared space, increasing the provision for both large motorbikes and bicycles, and recognising that we are not at a dead-end for cars, but merely a longer parking session, should be seen as positive challenges for an industry that has had to focus on more car capacity for too long. The problem is really that demand is about to change abruptly, and can the plans change that fast?

Rail and other forms of public transport face a different challenge that may end up forcing a radical rethink of both funding and services. As we will see in the next section it does not take a huge shift in individual travel behaviours – a few more days a month working from home, a few more meetings via video conference, going to work a bit later, coming home a bit earlier – to create a very big hole in the current funding model.

With even a fraction of the drop in demand that our respondents claim, what does that do to the business model at TFL? It certainly does not suggest a return to the old franchise model for train operators, but what does this mean for the number of services?

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#02 Attitudes to Automation

Following on from #01 Transport Use, this next section in the 7th Sense/**loop** trilogy focuses on public attitudes to automation, and the consequences for the industry.

A

The road to autonomy

We followed up the 2019 survey of UK 3,000 transport users – car owners, bus riders, train passengers, cyclists *et al* – with a further national poll of 3,000 people to investigate how times have changed and whether the COVID-19 crisis has impacted people's needs, expectation and acceptance of autonomy.

Are the young desperate to jump into sleeker, blander versions of boomer age products? Do they think a 'self-driving car' is really the best use of autonomous tech? Is the transition from urban connectedness in the form we have today to seamless intercity transportation pods and car-free cities just a matter of waiting for the luddites to shuffle off while we develop the tech?

Ever since Johnny Cab picked up Arnie on Mars in the Arnold Schwarzenegger film Total Recall, the vision for autonomous vehicles has been roughly the same: a series of auto-piloted car-like machines delivering their riders from home to a work or leisure destination. The core idea has been to replace a boring, stressful, error-prone human experience with a new fast automatic service where workers can relax between high-powered business meetings and their tranquil, suburban, leisure-filled lives.

As you might impart from the tone of the rhetoric, the answer is no... or at least, not yet.

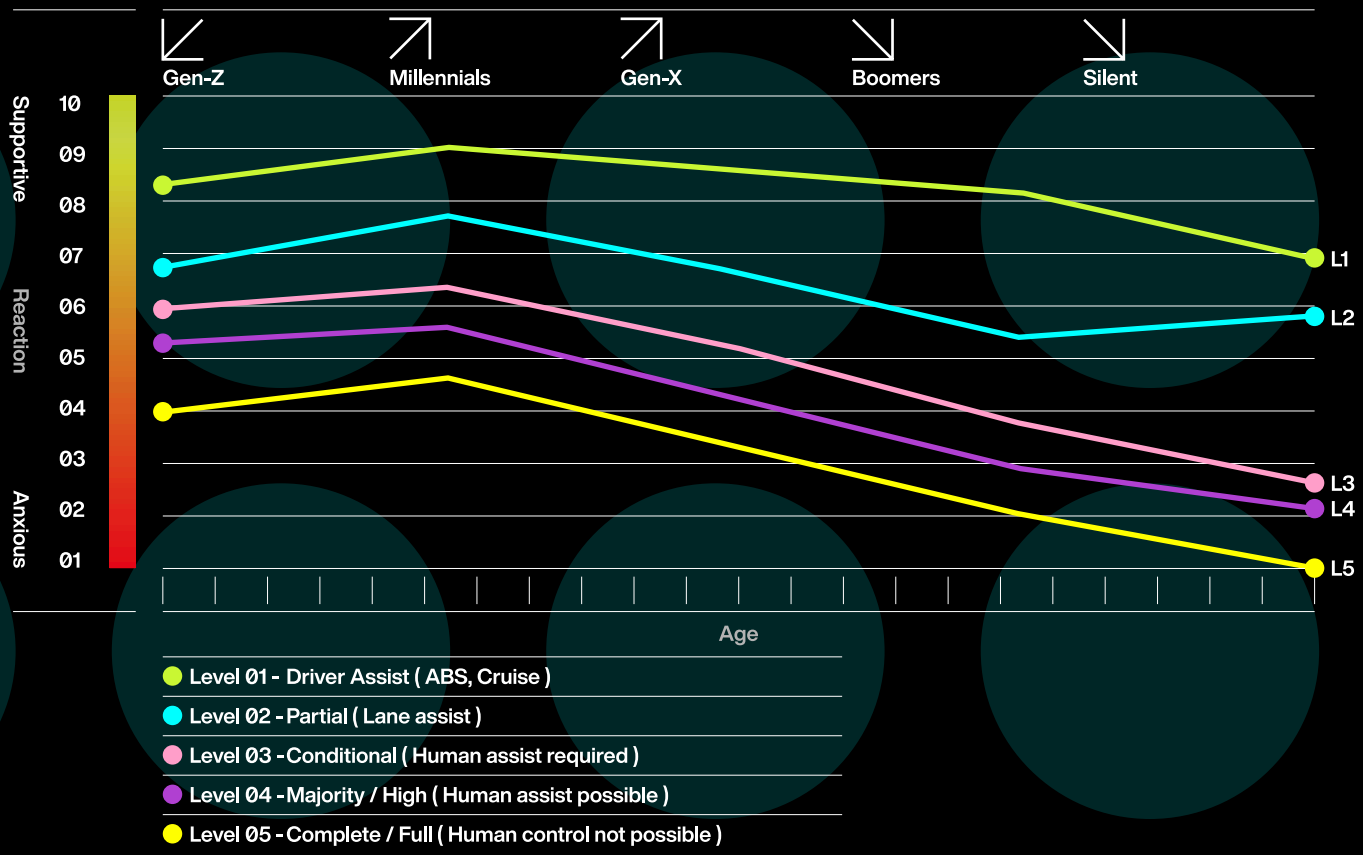
The reduction in congestion, accidents and pollution that automation promises is attractive, as is the removal of the hassle of car ownership and the acres of idle machines parked in driveways. Only the dyed-in-the-wool petrolhead might argue against those benefits, but is the car-buying public willing to give up the freedom, convenience and status that car ownership provides? Is the replacement of highly personal transportation with highly impersonal transportation really what people born after the launch of the first iPhone in 2007 demand from those planning this? There are still many questions to answer.

B

Automatic acceptance acceleration

Many observers assume, with good reason, that resistance to Connected Autonomous Vehicles/Mobility/Transportation is more prevalent in older people than 'digital natives'. The thinking being that those born living with tech, rather than seeing it invented, are far more likely to embrace autonomy and shared ownership as liberating and inevitable. While our study broadly supports this, we do not see a straight line of accelerating acceptance from old to young.

Acceptance of Autonomy 2020



Q "How comfortable are you with vehicles operating at each of these levels right now?"

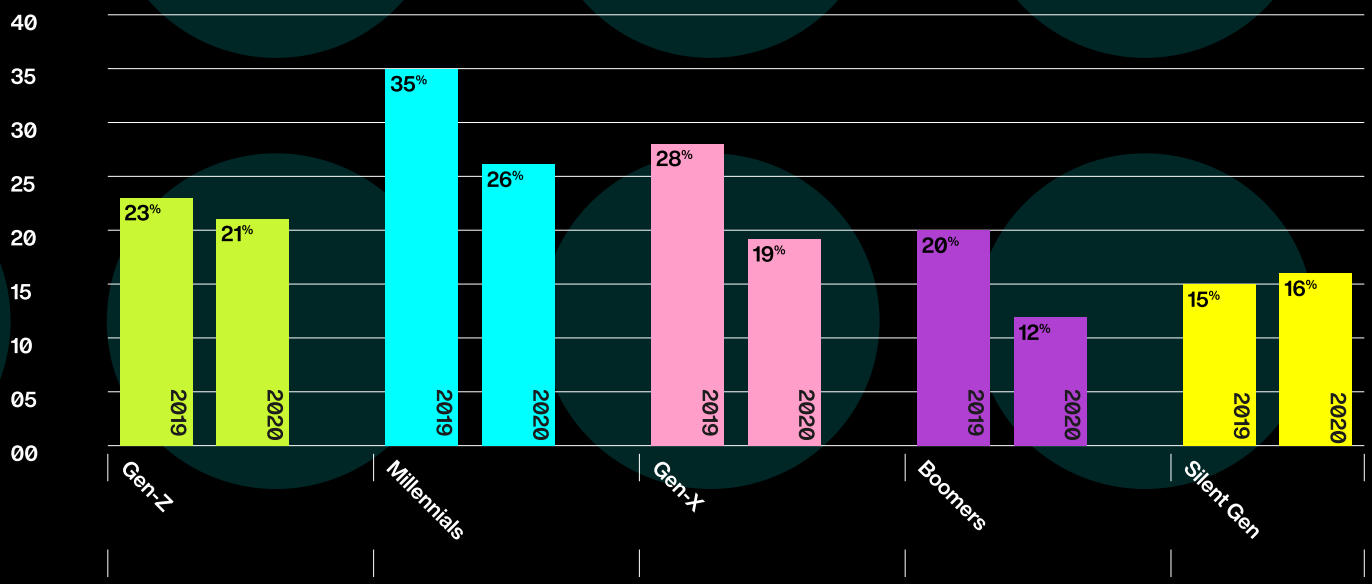
Gen-Z are not going to simply embrace, or even accept tech, just because it is tech. They appear more sceptical perhaps because of, not despite, their greater tech knowledge. Increasingly we see Gen-Z asking not to be taken for granted by big business. Their trust in technology and large corporations should not be assumed, but earned.

The appeal of Level 5 Autonomy (fully self-driving transportation) is at a point that, if we were undertaking traditional product research, we would advise a client to consider dropping the concept and perhaps seek specific areas that they found favourable. Evidence shows that full autonomy is unpopular among all ages, and therefore the business case for it struggles. However, it must be stressed that we presented the technology, not its benefits, deliberately, since this is the issue with autonomy as it stands. It has been developed on the 'because we can' basis, and we are attempting to reach what we believe may be within our grasp. If nobody wants it however, who will pay for it, and where will the fantastic valuations of tech be to certain OEMs if there is no customer base for it?

It is to be noted that this year's results are consistent with last year. We saw a similar dip in support from to Gen-Z compared to Millennials. This is not then an anomaly but significant and consistent and does not support the Automatic Acceleration of Acceptance that many assume from the younger generation. Across two surveys that's a clear and significant trend. With 6,000 people surveyed it's a finding the industry must address if it is to avoid missing its brave targets. Please ask for further analyses.

Autonomous vehicles as a good idea/interesting

When we gave people an open forum to discuss "What do you think about cars being able to drive themselves in the near future?", and analysed the sentiment within their responses, we again saw the deficit for Gen-Z compared to Millennials – consistent with 2019. We also saw quite a large dip compared to last year's study for Millennials and Gen X and Boomers, compared to 2019, A worrying trend from those most likely to be travelling the most.



Q "What do you think about cars being able to drive themselves in the near future?"

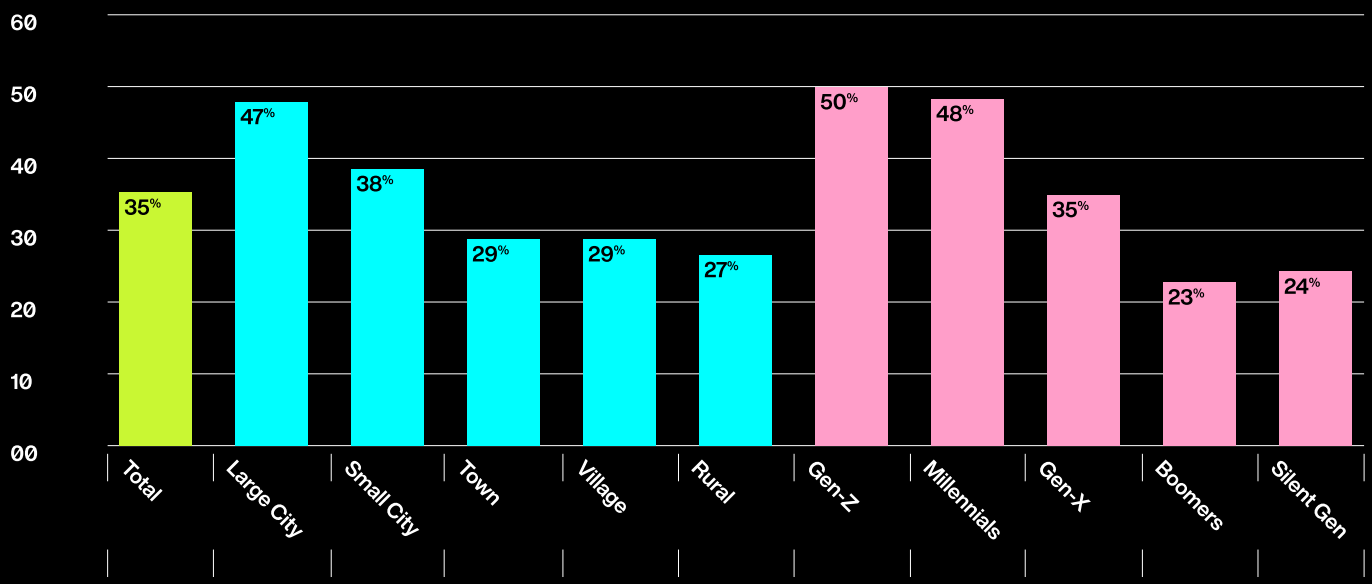
It is possible to speculate on the reasons behind this with quite logical and anecdotally supported reasoning. Mostly, people think we should be doing other more important stuff right now than making self-driving cars but, interestingly, it is the Silent Generation and Gen-Z who have barely changed their attitude. Despite clear evidence from the previous 2019 survey that, given the opportunity to say *anything*, fewer than 1 in 4 have anything positive to say about "cars driving themselves".

When asked directly, "Has the COVID-19 situation made driverless concepts more appealing to you, *because there is less need for direct human interaction?*" on average 35% say it has. Further, as we look at those who are more exposed to crowded situations – city dwellers and those who tend to have less access to personal transport such as younger age groups – we see even higher levels of positivity to this question.

Please get in touch for more details.

D

Has COVID-19 made driverless concepts more appealing?



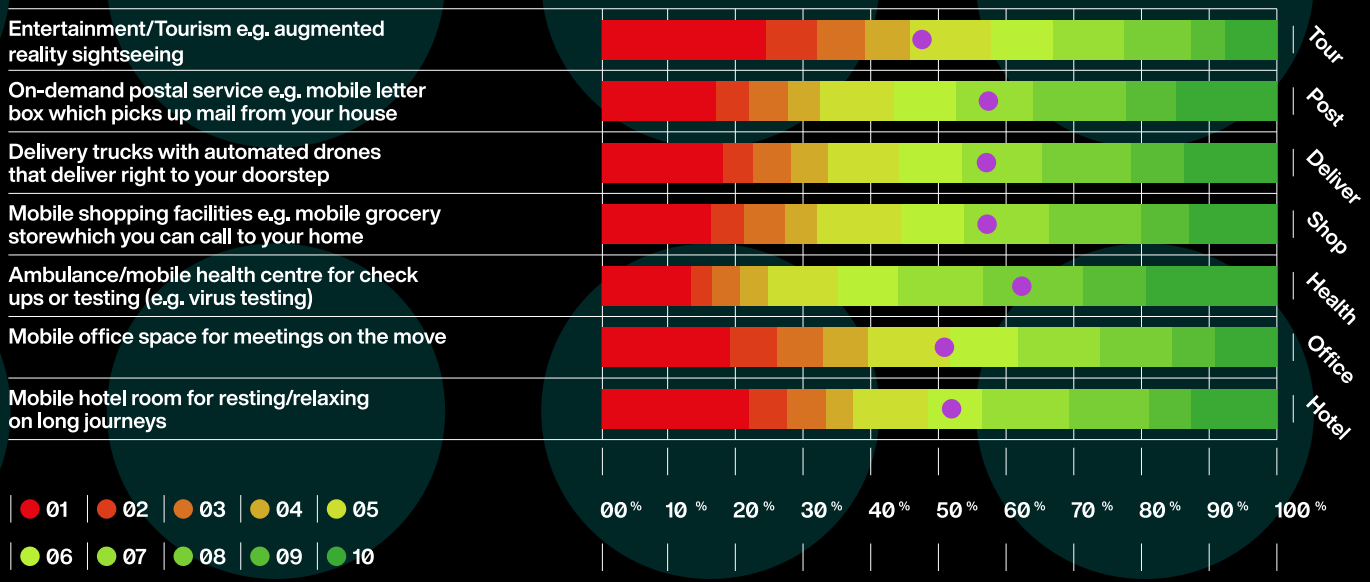
Q "Has the COVID-19 situation made driverless concepts more appealing to you, because there is less need for direct human interaction?"

This slightly more positive reaction to autonomy is found after respondents are shown various potential autonomous concepts, alongside the addition of the human interaction factor - see question and chart on the next page. This shows that education on the benefits of autonomy has a clear impact on approval and acceptance of it.

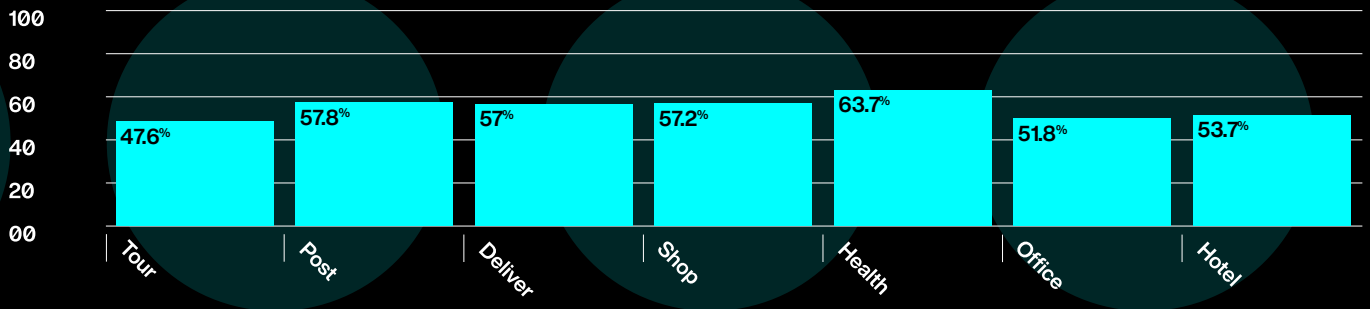
F

Autonomous Concepts

Individual appeal



Q "On a scale of 1 – 10 where 1 is low and 10 is high, how appealing are each of these autonomous concepts?"



The mean average scores for these concepts – if seen in a typical New Product Development (NPD) project would be alarmingly low. If a product is not making an average above 7.0 we don't believe it possible to reach a *positive* Net Promoter Score – i.e. would they recommend it to others? - which, while crude, is at least a reflection of general positivity.

This kind of rating would cause 'significant rethinking' (i.e. panic) in an automotive clinic situation. The distribution of scores is also quite enlightening. What is clear from the distribution of results is that there is no consensus. The 'middling' mean scores do not indicate a 'middling' idea, but one which is polarising. There is little agreement one way or the other.

There are clear groupings, some giving extremely low scores. Scores of 1s and 2s are quite rare in market research when describing new, helpful technologies - showing that there is a stubbornly alarmed segment who are actually *frightened* of autonomy. There are also a large number in the middle who just don't know, and finally a group who are very strong supporters. This question results in a slightly better overall sentiment than the first open-ended question which asked simply whether autonomous technology, as a concept, was a good thing. This shows the benefits, and thus gains better acceptance.

G

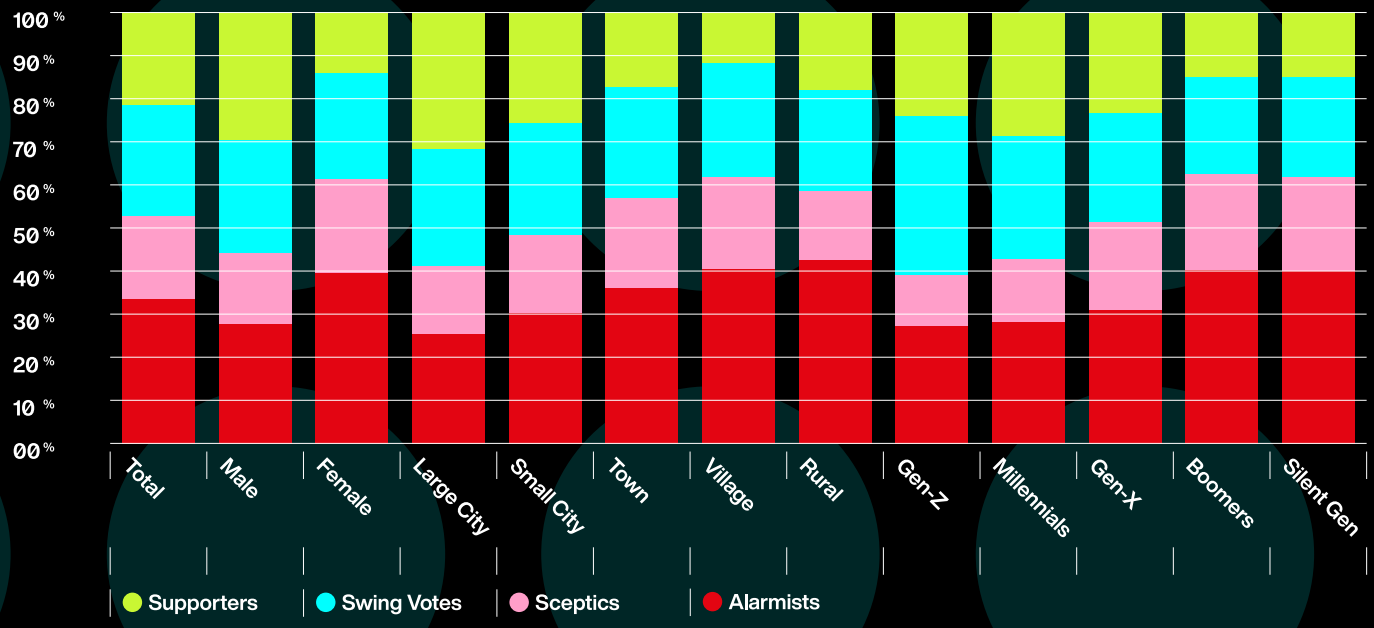
Variance in acceptance

As can be seen from Chart B, there is no continuous link between age and acceptance of autonomy. It's not the case that it is just old people who hate it and there is no evidence to suggest that, as the resistant older population shrinks, so the market will come good. There are significant nuances to understand in public perception of Connected Autonomous Vehicles/Mobility/Transport (CAV/M/T) so we took people's initial reaction to Question C and divided people into one of four camps:

1. Alarmists – people for who autonomy is actually frightening
2. Sceptics – these people are not convinced but are thinking about the issues
3. Swing voters – interested but a little unsure
4. Supporters – all out in favour of autonomy

What we see are some key geodemographic influences on overall opinion and these are perhaps predictable and could be stereotypical of assumed tech adoption/rejection factors.

Geodemographic Attitudes to CAV/M/T

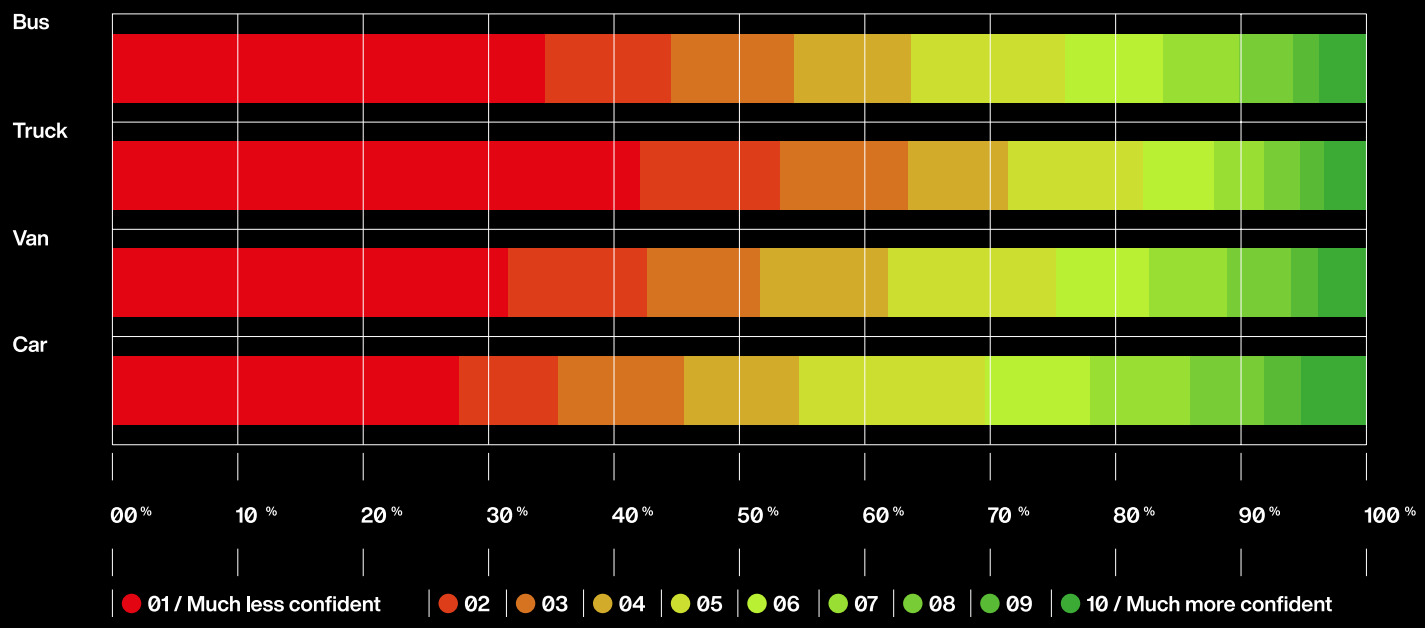


Q "What do you think about cars being able to drive themselves in the near future?"

While around half on average are broadly in favour of autonomous vehicles, we can see very clear variations in distribution e.g. 'Supporters' are more likely to be a male Millennial in a large city, 'Alarmists' on the other hand tend to be female, boomer/silent and in a village/rural location.

So, while we might stereotype Supporters quite easily - for example they are three times more likely than average to already own an electric scooter (please ask for further details) - what is clear is that most 'Supporters' are already well served for transport, both public and via cabs/ride sharing. They are also not as likely as older, female or rural respondents to be either excluded from public transport due to proximity, and not to have experienced widely reported unpleasant interactions while using it. Their support of autonomy isn't driven by 'need'. Conversely Alarmists – who are often the people that 'need' these services most are equally not seeing the benefit of autonomy in delivering such services to them. It is the Alarmists who ought to benefit most and the Supporters who need it least.

Confidence around CAVs



Q "How much more or less confident would you be around autonomous versions of these vehicles?"

While the safety capability of most mature autonomous systems are extremely high - higher often than human piloted vehicles - half the general public, and around 60% of women, are as yet unconvinced. CAVs are scary because computers go wrong too.

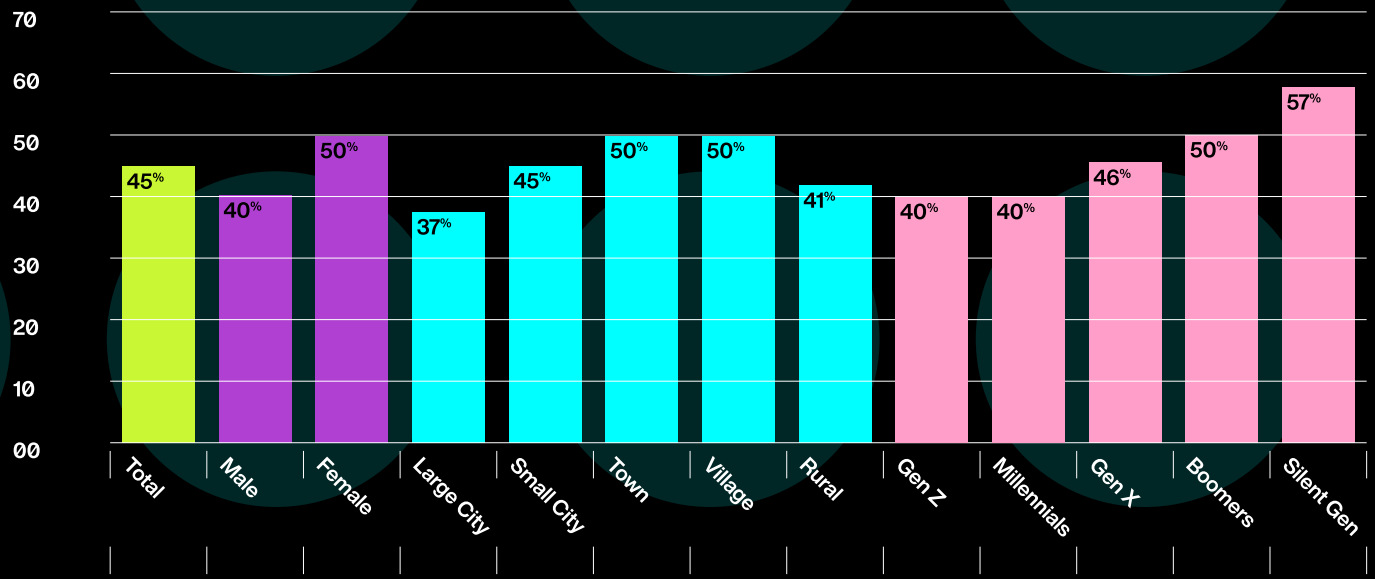
With more than 2 out of 4 of all people saying they would feel less confident (scoring 1 to 5 out of 10) around autonomous vehicles, this is 70% for cars and a massive 82% for trucks. This is a clear demonstration of a lack of public trust in the technology. However, it is also worth noting that this represents a significant fall in confidence from last year's survey where low confidence was: 51% Car, 62% Van, 71% Truck, 65% Bus, showing that significant variations in public attitudes can happen quickly – thus effective education/communication may have a positive impact.

We should assume that perceptions around questions on 'confidence' in public spaces may have been significantly altered by the current crisis. Yet this clearly shows that despite representing an ideal replacement for crowded mass transit systems, CAVs have become even less enticing to the public. The key driver behind this appears to be that people simply don't value the loss of freedom and choice that automation appears to represent. Very large proportions don't ever see a time where all their transport requirements can be met by CAVs.

H

Post Autonomy Vehicle Demand

I will always drive myself

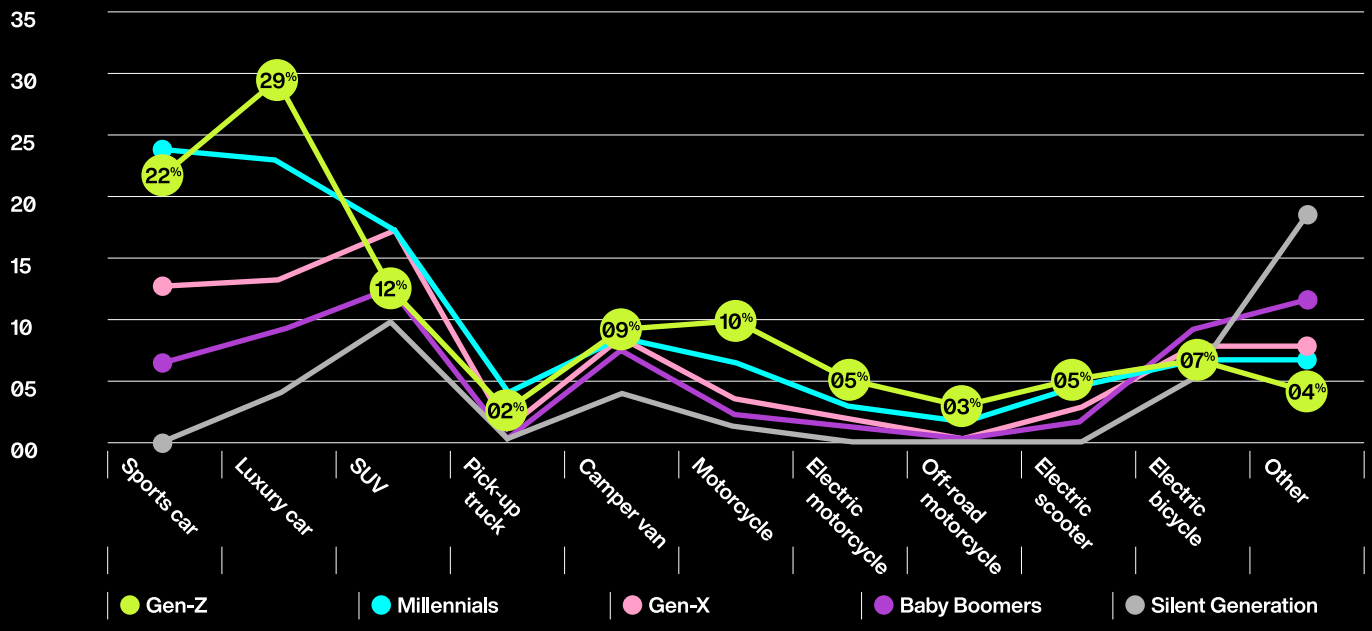


Q "If your everyday transport needs could be covered affordably by CAVs (connected and autonomous vehicles), which of the following would you still want to own for recreational use?"

A remarkable 45% reject ever needing CAVs alone. There are predictable geodemographic variations, but the fact that 40% of Gen-Z and Millennials want to retain non-autonomous driving ought to be a significant point to ponder for those who assume that all driving is a chore best left to the robots.

When asked the same question and given specific options, it is interesting to see that far from being the leaders in disposing of silly old fashioned concepts like ownership or cars-as-status-symbols, Gen-Z are the most interested in owning a luxury vehicle, with Millennials a close second. This pattern was similar in our 2019 study and shows quite clearly that the expression, status and symbolism of the car is not lost on the younger generation but actually embraced for post-functional demand.

Post-Autonomy Recreational Vehicle Demand



Q "If your everyday transport needs could be covered affordably by CAVs (connected and autonomous vehicles), which of the following would you still want to own for recreational use?"

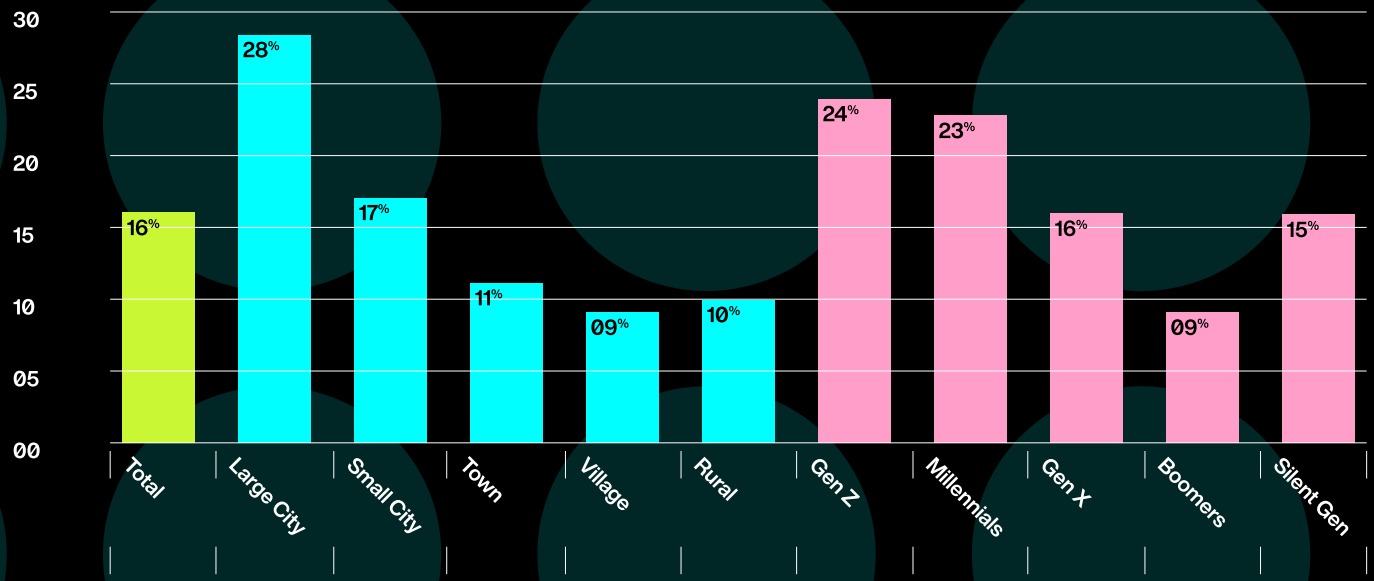
The reasoning behind this is fascinating and will be explored in further depth in Driving the Future #03: Human After All, the final instalment of our trilogy.

Autonomy; positives and payment

Some positives can be taken from this study, however. In report #01 we saw huge numbers planning to rethink their use of public transport, and further to that we saw above that the crisis has made driverless concepts more appealing for 35% of respondents. However, it is also a boost for various forms of autonomous public transport – most obviously bus. Despite only 16% of the general public agreeing that they would be more likely to use public transport if it were autonomous instead of human-operated, this rises sharply in the very locations where it is most likely to be introduced first.

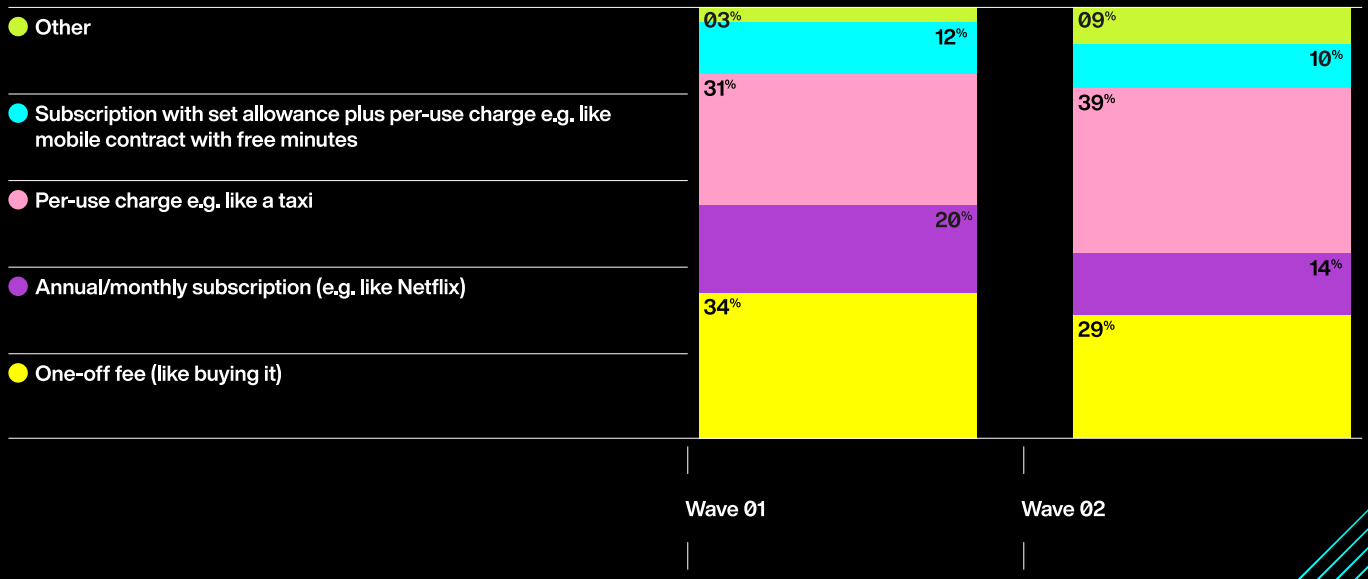
Well over a quarter of large city respondents would be more likely. It is worth noting that quite often people in village/rural areas don't use public transport simply because it doesn't exist, and hence ways of introducing services in these locations due to autonomy is likely to increase positivity.

More likely to use public transport if it were Autonomous



The crisis has also affected how people view their long-term planning. Figures around preferred payment methods for Connected Autonomous Mobility show a movement toward single-use and away from annual subscription – as we saw in report #01, which means season tickets are under significant threat, and business models that rely on annual subscriptions will likely be subject to significant pressure.

Best ways to pay



Q "Which one of these would be the most appealing way to pay for access to autonomous transport?"

A 6% overall reduction represents just under a third moving away from annual subscription, with a big increase in those thinking that a per-use charge makes most sense. It is clear that there are still a very large number that think owning their own CAV is their preferred route yet there are few providers who propose this solution.

The answers to why this is the case and what else people still crave from motoring will be examined in Driving the Future part #03 – Human After All. In that report we will see that even if a zero ownership, homogenous, on-demand fleet undoubtedly makes the most sense, it is still the case that - as with the climate crisis and reactions to lockdown (and beer and burgers) - what's best for humanity is not often what we *want*. And it certainly isn't what we choose to pay for.

Driving *the* Future 02

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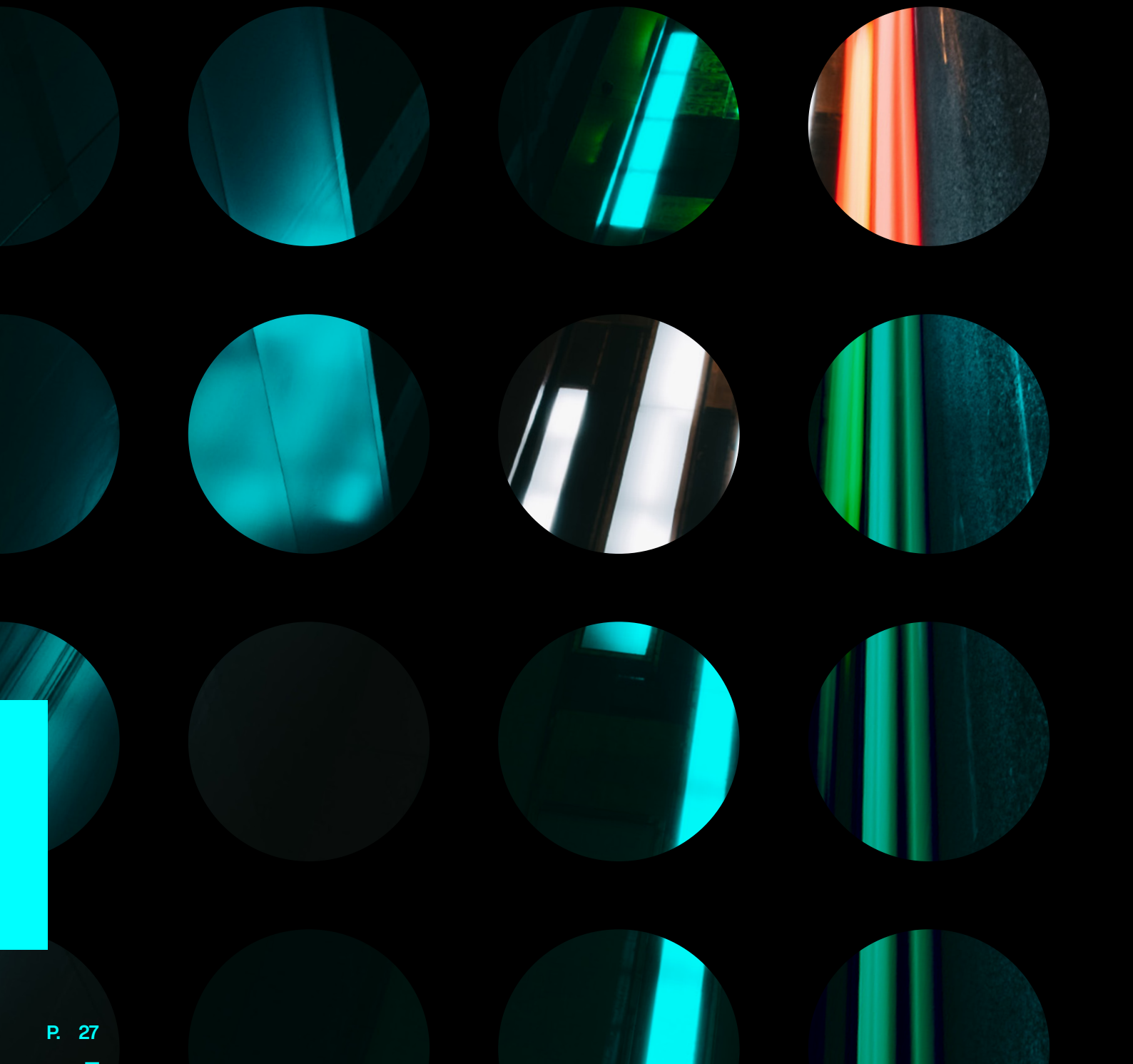
#02 Attitudes to Automation



Conclusion

Autonomous vehicles clearly offer potential solutions to important questions but there is a significant lack of demand. Many don't see a clear advantage, CAVs are answering a question most people aren't asking.

While there are many more young people in favour of autonomy than old people, there are more who, while unlikely to have experienced the mixed blessing of owning a luxury car, very clearly aspire to it. OEMs and CAM operators that can fulfil that need are going to capitalise on a market that those who focus on anonymous, public transport-esque people-moving will miss. Autonomy is coming but the people who will most likely live with it – and pay for it - want something more than 'mere' mobility.

To many the car still means freedom, even to those such as Gen-Z and Millennials who often don't own one. So, what does it mean if it is autonomous and thus not capable of delivering freedom? Appealing to our desires and aspirations is going to be much more effective than simply reducing driving to an inconvenience to be replaced with yet more hours in front of a screen.

As can be seen in Driving the Future Report #01 the COVID-19 crisis will make significant, permanent changes to how we live, work and travel, and the autonomy industry represents a multi-faceted opportunity not only to provide abundant, safe transportation but also jobs and economic activity during the recovery. However, any messaging that is being undertaken is not cutting through and currently the entire concept of autonomy finds itself in a worse position than before the crisis, despite being offering multiple obvious benefits. Now is clearly the time for a co-ordinated conversation about the purpose of autonomy coupled with a refocus on the benefits over the technology.

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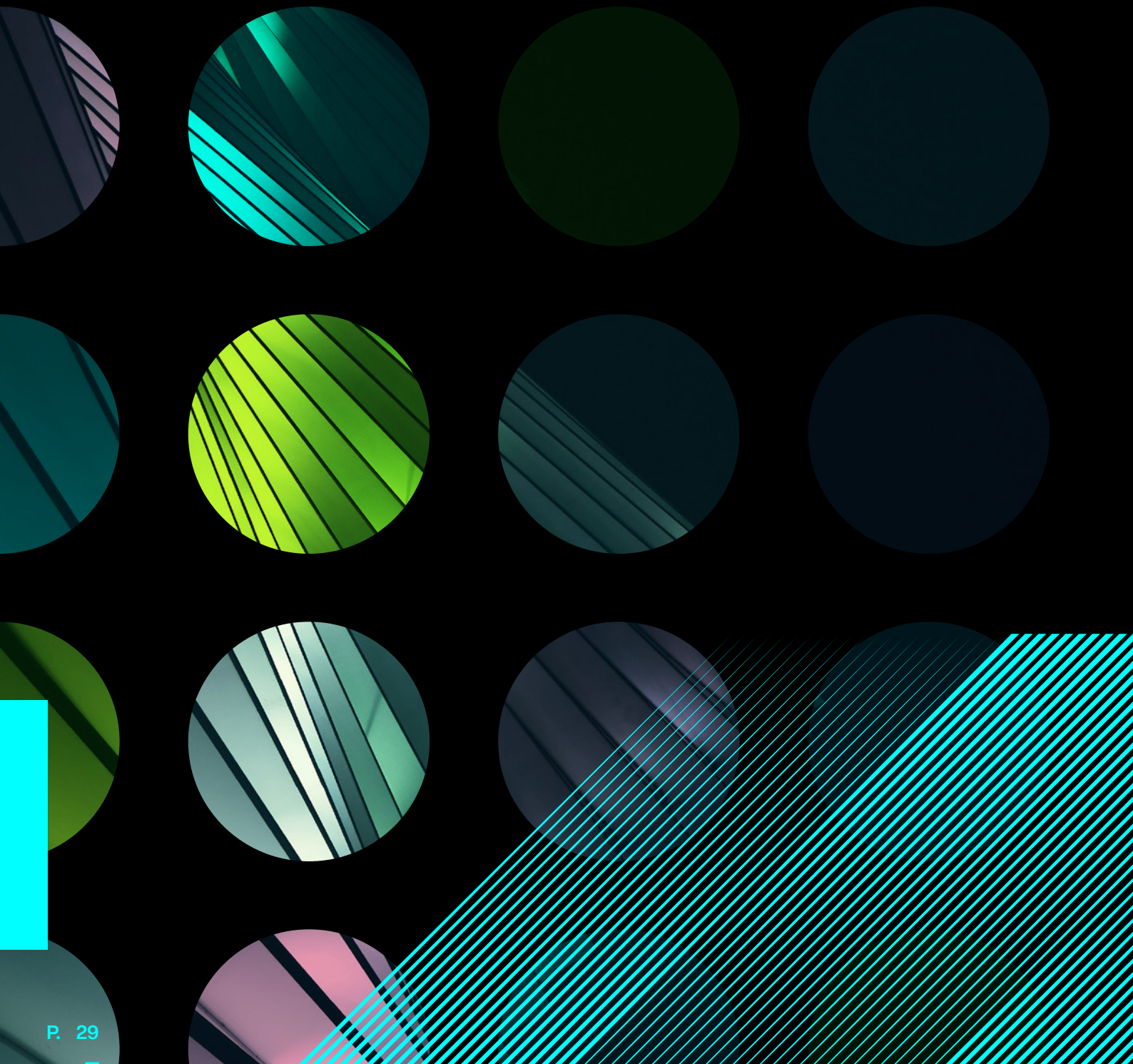
#03 We're only human after all

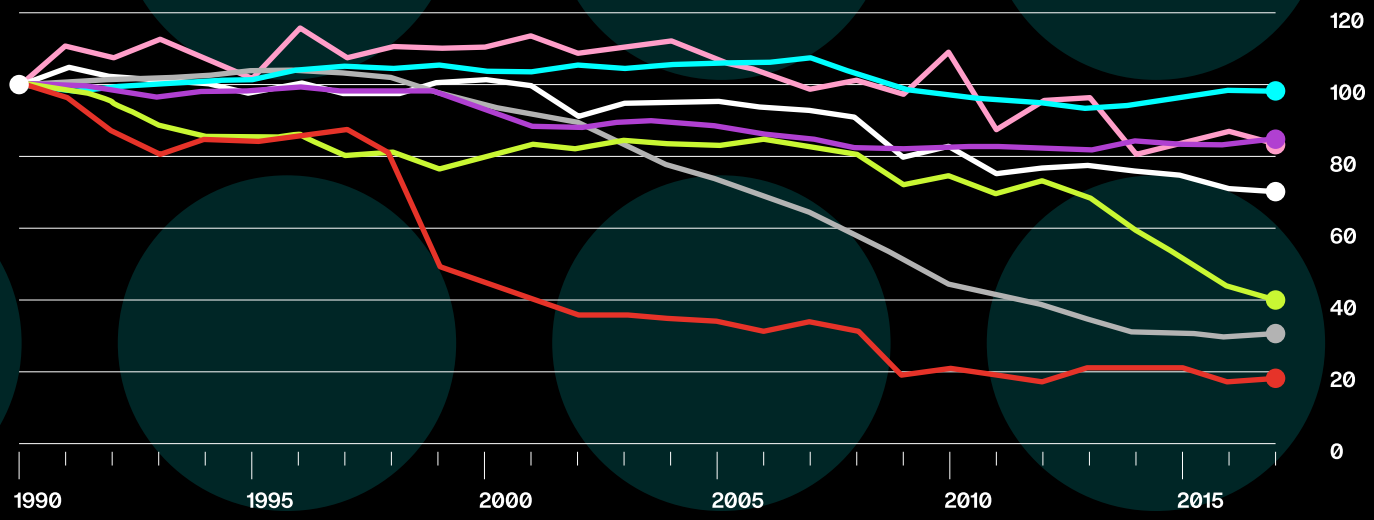


Humans like change, but also they don’t

A

Progress in cutting emissions has varied widely

UK greenhouse gas emissions, metric tons C02 equivalent *(equalised, change since 1990)*



- Energy supply
- Transport
- Residential
- Agriculture
- Industrial processes
- Waste
- Business

Source: Department for Business, Energy & Industrial Strategy

So, change is imperative and automation and Mobility as a Service (MaaS) could help to reduce emissions dramatically; fewer traffic jams, more shared journeys, improved productivity by working on the move, phased working times, more efficient propulsion etc. All contribute to lower emissions per mile than for traditional, owned, human-driven machines.

It follows that automation or MaaS should be adopted with much greater speed, along with the general removal of the hassle of car ownership in order to deliver a much lower overall carbon footprint. However, our Driving the Future study shows that there is a real problem with this: people still want to buy a car, own a car and drive it themselves.

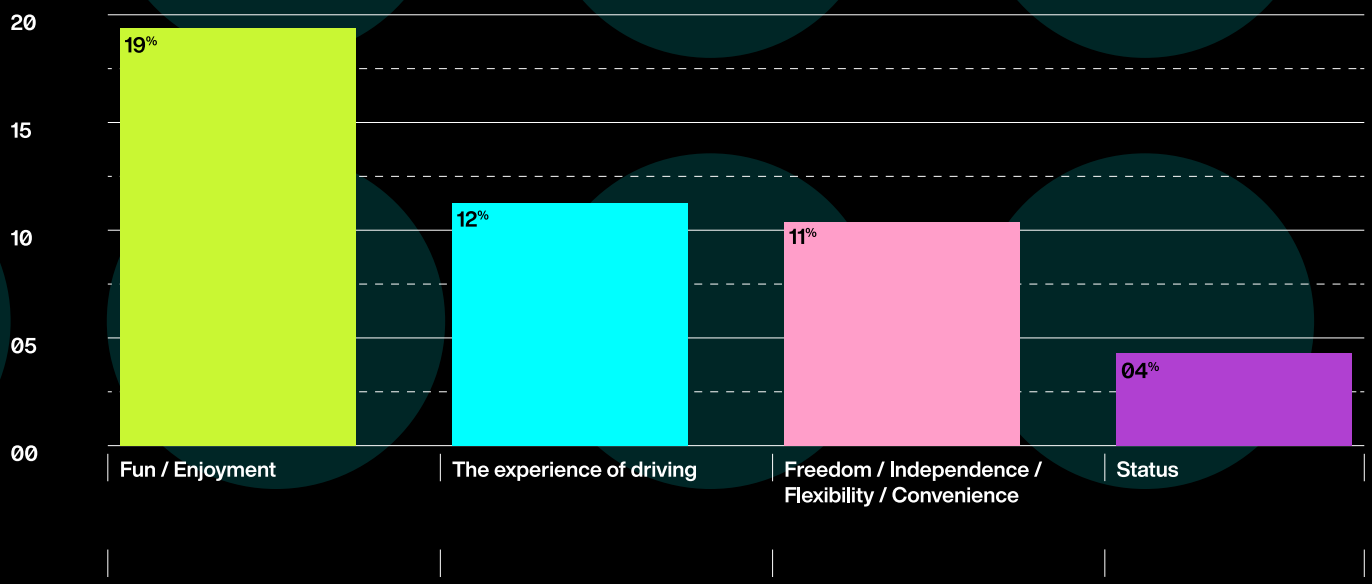
As we saw in *Driving the Future 02* - Attitudes to Automation , 45% of the people we spoke to say that they will always drive themselves rather than rely on autonomy, and around one in four still want a luxury or sports car for recreational purposes.

Simple evolutionary anthropology demonstrates the need for one person to have advantage over another. Evolutionary advantage is a basic driver of human decisions, from the need to accumulate and then to procreate. Acquisition of resources provides a higher chance of success to your offspring and enables you to be more attractive to potential co-procreators. This basic fundamental drives the choice of many items, to display this ability to acquire resource, especially car choice, ownership of cars and driving them.

B

Fun is fundamental

But another problem for the concept of shared mobility is fun. Fun, it turns out, is fundamental. People enjoy the physical feeling of driving. There are enough times that they do enjoy driving compared to those where it is actually a chore, meaning that there are times when they really want to have the option to drive themselves.



Q "Why would you still want to own a car?"

Our survey found a very large number of people, across all generations who want to always drive themselves – 45% across all ages and still 40% of Gen-Z - and of those almost one in five said it was due to finding driving in some way fun. That leaves those brands that do produce fun cars with a much rosier future than might be predicted by some forecasters.

"Making it automated would take away from the experience and pleasure"

(DtF Survey Open Text response)

"I enjoy driving, the process, the challenge and the freedom"

(DtF Survey Open Text response)

What will roads be for?

+ Always drive myself	45%	(→40% Gen-Z)
+ Will own a luxury car	15%	(→29% Gen-Z)
+Uncomfortable with L2	45%	
+ CAV replace cars?	15%	
+ CAV transport vulnerable	31%	(→45% Gen-Z)
+ Don't know what CAV for	36%	

Want to buy post lockdown

+ E-bike (all large cities)	20%
+ E-scooter (all large cities)	11%
+ Bicycle (Gen-Z)	28%

This may be as much about the physical enjoyment of the sensation as the need to be in control. Fewer and fewer options exist for people to control their environment: the feeling of being in charge of something at least connects to feelings of having the power to decide, to have agency in their lives, of being 'successful'. Being in control is the explicit opposite of automation. This is not an expression of doubt in the autonomous tech or doubt in the convenience but simply a wish to 'do it myself'? As Matthew B Crawford of the Institute for Advanced Studies in Culture at the University of Virginia states in his 2020 book "Why We Drive"; "...technocrats and optimisers seek to make everything idiot-proof, and pursue this by treating us like idiots. It is a presumption that tends to be self-fulfilling; we really do feel ourselves becoming dumber. Against such a backdrop, to drive is to exercise one's skill at being free."

Driving in this sense is not just about cars, it is about driving or controlling things full stop. One demonstrates the very fact of one's existence with action; doing and being are fundamentally linked, just ask Socrates, Sartre – and Sinatra.

A sense of 'ownership', of acquisition is also a key component of human satisfaction. The ability to express one's status is a very obvious element of resource acquisition and, for many people, this is still vital to them.

"There is a certain joy in being able to buy a luxury car"

(DtF Survey Open Text response)

Then there is the comfort and certainty that they have their vehicle at hand for deployment whenever they want, in their choice of materials, colours and functionality and crucially with their stuff in it. It's there and it's theirs. Shared, on-demand vehicles simply can't provide this.

"Sharing is not very luxurious to me"

(DtF Survey Open Text response)

C

Automation is hard

Perhaps the most obvious current flaw in automation is that it is not accelerating toward us with the speed anticipated. It has been 'about to be launched' for the last few years, but seems to get stuck around Level 4 automation: the difficulty in achieving full automation is staggering.

Teaching a car to drive isn't as simple as teaching it a facile game, such as chess. The most powerful computers on earth (humans) aren't allowed to be programmed for driving until they have had around 150,000 hours of experience just moving around – i.e. around their 17th birthday. Even then, most insurance companies won't touch a 17-year-old driver and, if they do, the costs are staggering. It only becomes affordable if you can prove you don't crash a lot – and that takes time. That's time that automation algorithms simply haven't had, and machines are not afforded the same fallibility as humans. So autonomous vehicles have to be better at driving than the most powerful computers on earth – which have had 17 years of programming – and which still often (to the tune of 1 million road deaths a year) get it very wrong.

This means that people have yet to see a truly autonomous vehicle. They've also yet to see one that looks fun, cool, or desirable, and as Apple shareholders will tell you (endlessly...) desirability makes all the difference. What's different about cars versus computers or phones is that old cars, with less automation, that are more human and less digital, are often more desirable than their modern counterparts.

D

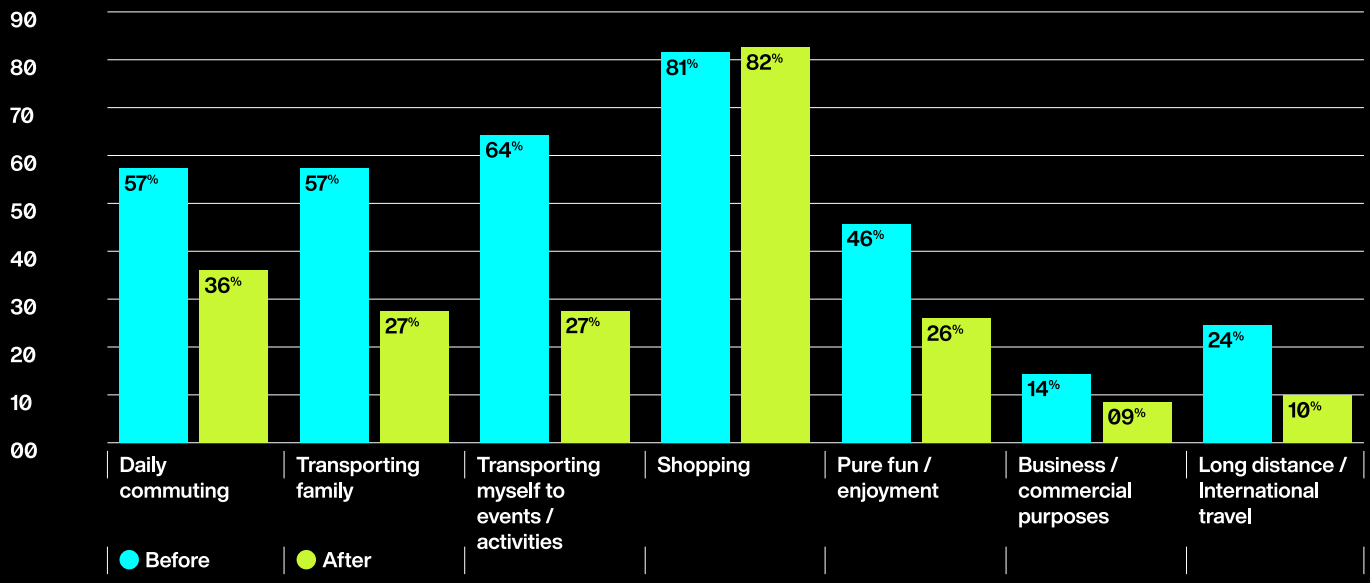
The alternatives are ok

The convenience that autonomous vehicles can deliver is clear, but in the UK they are battling a fairly agreeable/acceptable public transport system – an 'OK, not brilliant' network, but far from the totally shocking disaster that many talk about. In our study around third rated their pre-COVID public transport options either 8, 9 or 10 out of 10. Indeed 11% of our respondents had "no issues at all" with public transport and a further 29% say they "had no need for public transport". This means that for around 60% of Brits, a new clean quiet hassle-free mobility service isn't currently required, thanks.

That does, however, leave a sizeable chunk of the population who might find CAVs/MaaS an attractive option to replace their commute, or trip to the shops, so there is a chink of light. However, even in lockdown where most car use halved, shopping was still hugely important and a good 25% of people still just went out to enjoy a drive. This means that demand for, and excitement around, CAVs and MaaS is pretty low; our research shows that 29% "don't know what CAVs are for".

Kings of convenience

What do you use your car for?



As is well known, the pandemic has pushed shopping even further online but despite that, those who own cars are still using them to go to the shop – perhaps not as often but the ability to just jump in and go is clearly still really useful. People, it seems, would rather not go to work than not be able to get some milk for their tea (well, obviously).

Online shopping behaviour may well stick: the reduction in rural car use experienced during the crisis could continue as people conclude that they can save a great deal of time by simply having their stuff delivered. But the knowledge that their car is there, that they can immediately go and get what they need is clearly of immense utility - people don't want to risk being left without. Though alternatives in the form of better delivery services surely could reduce this anxiety, good delivery services were made available to most of us during lockdown and yet 82% of car owners still used their car to go to the shops.

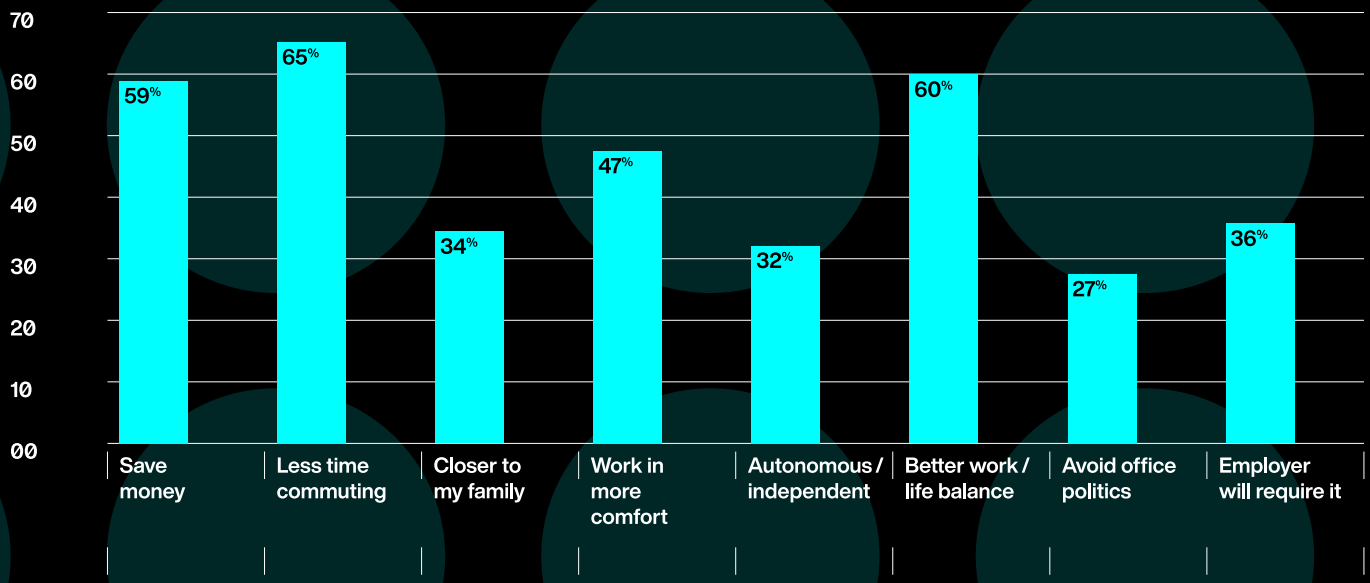
The reassurance of access to this most useful of tools appears to be vital on a very human level, when sensibly it really isn't a good idea to have a highly complex machine depreciating on your driveway if all you use it for is to get a pint of milk now and again. But then these are human choices, and they rarely do make a lot of sense.

WFH takes its toll on the demand for transport

Our study showed that pre-COVID, 36% used their car for the commute, but that is also likely to change. With 65% of our respondents working from home during lockdown and 46% of those saying they will work from home more frequently, the need for commuting options will diminish. If each person works from home one day more a week, we'll see a 20% reduction in weekly footfall across all forms of transport (not to mention coffee shops and sandwich bars).

The key reasons why people don't want to go back to the office or place of work are not solved by CAV/MaaS. The reality is that homeworking saves time and money. And while MaaS may eventually be faster due to reduced congestion and improved rerouting, it won't be free.

Why work from home?

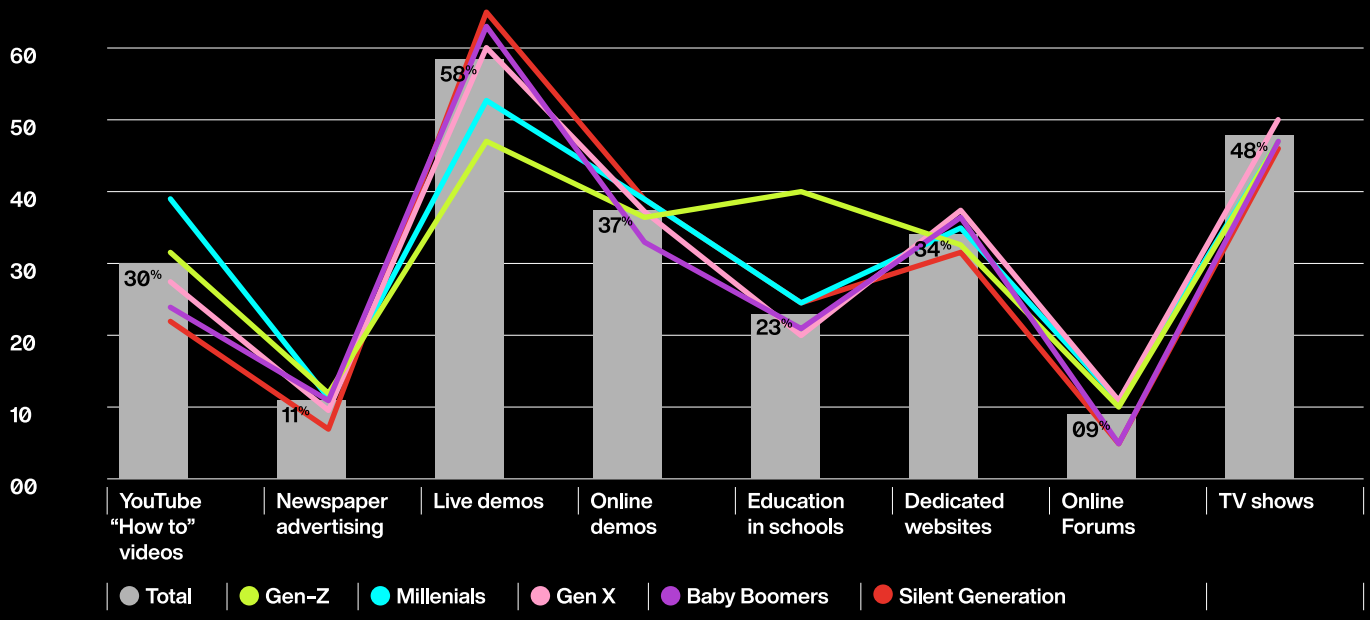


They don't know what they're missing

People then are not desperate for a solution to the road transport problem, though it is fundamental that we achieve one. So, how best to show people what they are missing and what automation can do?

Well, it turns out to be remarkably similar across the generations: humans need to see the benefits with their own eyes.

How to educate on CAV/MaaS



The key element of this finding is that Gen-Z are less into live demos than the rest but are very keen that "CAVs, Connected Transport and Future Mobility should be taught about in schools".

It appears that getting the public to interact with an automated vehicle is what's really needed to change minds: that and a product that looks and feels like their own luxury car, sports car or SUV all at once.

We can clearly see a desperate need to reduce emissions, congestion and waste, and CAV/MaaS is a fundamental component of that, but to achieve mass adoption the alternative must be better, cheaper and more fun or impressive than what we currently have.

People don't want to feel out of control. Automation makes people feel less safe, despite the arguably better safety record of CAVs vs humans: c 1.18 deaths/100 million miles for humans (USA) vs Waymo managed 0 deaths in 5 million self-driven miles (albeit on a much lower number of miles) but if they don't get to see and experience it with their own eyes they will simply not be interested.

Private cars are individual, convenient, cool, fun status symbols. Autonomy is a function, but if it can be seen as 'desirable' with all the facets of private cars accommodated into it, attitudes will change. At present, however, autonomous vehicle technology, as a mass replacement of a series of complex human symbols, is still unappealing to the majority of the population. They can't own it, choose what's in it, drive it or, indeed, enjoy it.

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#03 We're only human after all

Conclusion

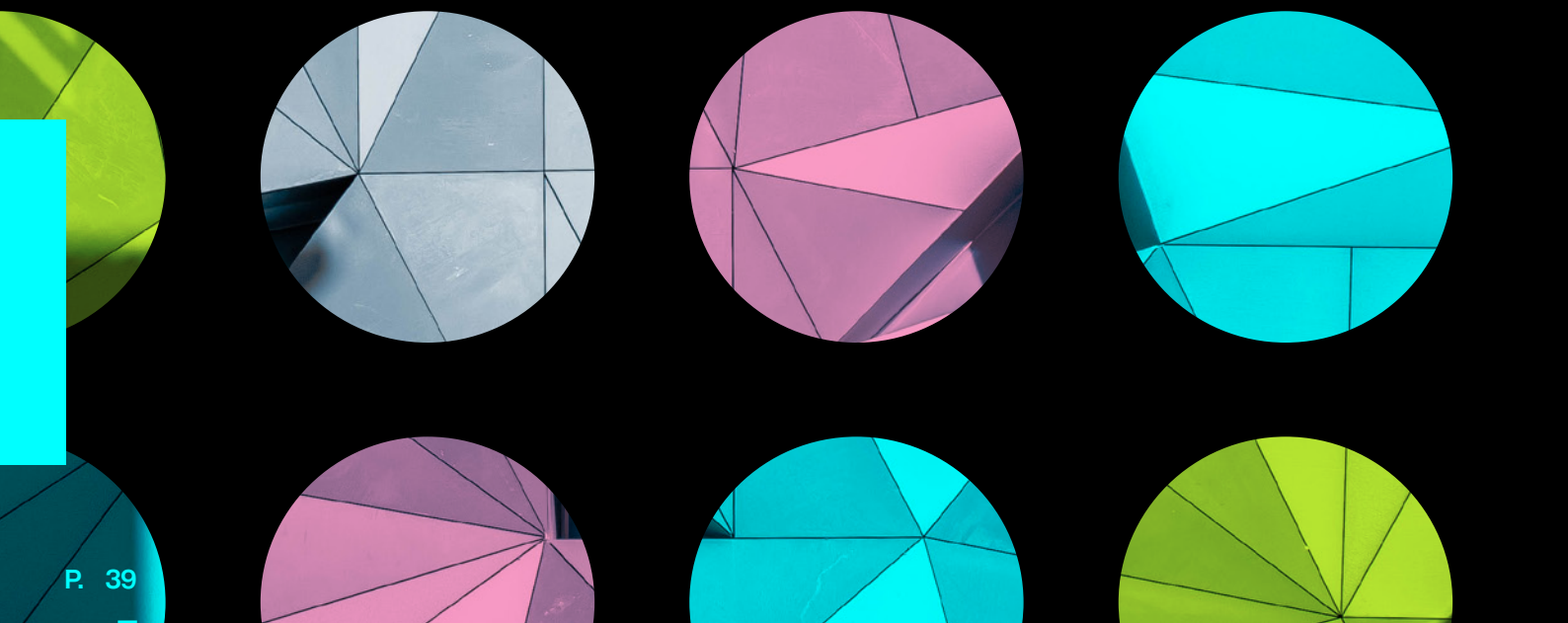
Autonomy could deliver a bright future of cool cars, you'll love to drive.

The future for OEMs making desirable, fun, expressive products is theirs for the taking. Those producing commodity transport, however, are going to get squeezed by autonomy, but also by reduced need, from online shopping, working from home and better public transport.

So, are there opportunities for automation to increase the fun, increase convenience, improve status and opportunity for expression? Autonomy can clearly start by removing the humdrum and leaving the bits that are fun to the driver. By being in control of the really interesting bits of a journey people can enjoy themselves and be transported through the dull/annoying bits with ease, be that enjoying a night out or schlepping though the city on the way to the exciting country roads.

The status or configuration of vehicles will be one key area where luxury or premium brands ought to be able to make a difference. Using a high-end sports car or luxury car for short periods may become acceptable, but it's more likely that one can own a status symbol vehicle but not have to use it to go to the shops – or the tip – because there are clean convenient CAVs to do those horrid bits for you. This will allow you to luxuriate, express yourself or enjoy yourself in your real car, the one you actually want .

There is a clear opportunity for OEMs to produce exciting things people want, where the need to be humdrum will be gone. Automation, shared ownership and MaaS are actually great opportunities for designers, engineers and manufacturers to be freed from the constraints of the everyday and enter a new, shiny, gleaming future of the extraordinary that autonomous vehicles can offer.



What does it all mean?

There's no denying that COVID-19 has turned public transport on its head and has made significant, permanent changes to how we live, work and travel. As a result, the autonomy industry represents a multi-faceted opportunity not only to provide abundant, safe transportation but also jobs and economic activity during the recovery. However, we can't ignore the environment.

As a species, we're obliged to change. It's a simple equation that our emission of planet-warming gases has to be reversed in order that there remains a planet for us to pollute. Progress has been steady in the UK, but when it comes to road traffic the dial isn't moving fast enough compared to other activities. It's estimated to cause around 20% of carbon emissions in the UK and is pretty much at 100% of its 1990 levels.

Autonomous vehicles clearly offer potential solutions to important questions but there is a significant lack of demand from us, the users. Many don't see a clear advantage, and CAVs are answering a question most people aren't asking. This means now is clearly the time for a co-ordinated conversation about the purpose of autonomy coupled with a refocus on the benefits over the technology.

While there are many more young people in favour of autonomy than old people, there are more who, while unlikely to have experienced the mixed blessing of owning a luxury car, very clearly aspire to it. OEMs and CAM operators that can fulfil that need are going to capitalise on a market that those who focus on anonymous, public transport-esque people-moving will miss. So, autonomy is coming but the people who will most likely live with it – and pay for it - want something more than 'mere' mobility.

What we do know is that humans are hardwired to enjoy novelty and countless studies show we are made happier by changes in our environment - by new stuff. Autonomous vehicles represent some of the newest stuff we have, but they also represent some of the coolest stuff we have. And, as a species, we really like cool stuff.

Being in control is vital though, and free will as a fundamental of human exitance. Anyone predicting that we'll give up the idea of driving cars for fun, based on the research to date, is wildly out of touch.

To many the car still means freedom, even to those such as Gen-Z and Millennials who often don't own one. So, what does it mean if it is autonomous and thus not capable of delivering freedom? Appealing to our desires and aspirations is going to be much more effective than simply reducing driving to an inconvenience to be replaced with yet more hours in front of a screen.

If you want an a parallel, take the horse. As a mode of transport, it was superseded first by the push-bike and later the car, yet whilst even Frankie Dettori doesn't ride a horse to work, thousands of people the world over still enjoy the concept of riding – either personally or vicariously through sport. If we were purely focused on the functional as a species, horses would have been put out to pasture long ago.

Freedom, agency and enjoyment are fundamental to us as humans and whilst automation can help us, if manufacturers want humans to want their products, they need to make them for humans not to replace humans.

This is a journey that we're going to continue to monitor, and we'll see just how things continue to change when we survey next and see what is Driving the Future.

Fergus McVey
CEO, 7th Sense Research UK

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