Autonomous vehicles: changing the public attitude

How does Government take people on the AV journey? How do they win hearts and minds? What about education? **Beate Kubitz** asks the questions

ABOUT THE AUTHOR

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Any positive statement about autonomous vehicles seems to provoke an almost immediate counter factual or negative consequence.

> "Removing the human error from vehicles will remove the biggest cause of accidents."
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> "Driverless cars in the US have already shown that they're still prone to failure and one has already killed a pedestrian."
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> "Driverless vehicles will need such orderly streets that pedestrians and cyclists will be either in danger or fenced off the roads."
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> "Connected vehicles will reduce street clutter because they won't need traffic lights or signs."
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> "Streets without signage will be dangerous for pedestrians and cyclist because they won't know what rules the vehicles are obeying."
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> "Autonomous ride share will enable such cheap mobility that everyone can travel."
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> "Cheap, on demand, mobility will create a society of people who never walk – and a public health crisis."

The evangelists and detractors around autonomous vehicles tend to characterise them in such different ways that it leads Glenn Lyons, Mott MacDonald professor of future mobility at the University of the West of England, to describe them as a 'wicked problem' – not a problem that is evil but one that is resistant to resolution, with incomplete contradictory and changing requirements that are often difficult to recognise.

There is a subtle distinction between driverless cars – which are seen as personal transport – and autonomous vehicles in general. When it comes to lorries forming platoons and reducing fuel consumption or autonomy enabling nighttime deliveries and more efficient logistics, the debate is less fierce.

On the subject of driverless cars, however, there are quite strong opposing views between those who see primarily the potential benefits and those who mainly see the disbenefits. There's also a strong feeling that driverless cars will happen whatever the prevailing view because of the momentum of the automotive and tech industries, supported by the Government for largely economic reasons.

This mistrust of technology forging ahead 'whether we like it or not' is one of the core backlashes against the idea of driverless cars. Given this, an approach that focuses solely on 'winning hearts and minds' is maybe not the most productive way of approaching public engagement on driverless vehicles as it assumes that the benefits are given and the path predetermined.

The lack of wider public involvement in the process of shaping the framework around driverless vehicles is unhelpful.

This is typified by the attitude that the public cannot imagine the paradigm shift that driverless vehicles represent so their views do not carry weight – summarised by the glib aphorism 'if we had asked the public what they wanted in 1900 they'd probably have said a faster horse'.

Car manufacturers and technology companies have been investing heavily in recent years to develop the systems needed to make driverless cars a reality.

The UK Government has supported them as it recognises the advantages autonomous vehicles (AVs) may have in easing congestion as well as improving safety and mobility.

And, as most believe an AV goes hand-in-hand with an EV (electric vehicle), air quality would also improve.

The Government is keen for the public to experience the technology first-hand and plans trials of fully self-driving vehicles on UK roads by 2021, as part of its modern Industrial Strategy. The trials will include an autonomous bus service across the Forth Bridge from Fife to Edinburgh, and self-driving taxi services in London.

The perception of the inevitability of progress towards driverless vehicles – with the industry and government persuading and pushing the public to its point of view - is not helpful. This is not like the mobile phone, which, while transformative, never faced quite the same objections. The car has shaped society once – the likelihood of autonomous vehicles reshaping society and the very fabric of our infrastructure means that it is essential that there is wider public debate and involvement shaping the use of this technology on our roads.

As Lyons puts it: "Here's the problem as I see it. It seems with little prior soul-searching or at least consultation and debate, it was 'decided' that driverless cars are the future and that they should be brought into existence because they will deliver benefits. As a result, we have government- and industry-backed armies of experts working to deliver this. It's being called innovation.

"It's created an 'in group' and an 'out group'. Those in the former (led by the evangelists) largely talk and collaborate among themselves. Those in the latter (led by the opponents) largely talk and collaborate among themselves.

"Conferences and Twitter feeds for individuals in the groups create the illusion of their group being the epicentre of what matters. The other group is inferior and doesn't get it."

42%
of the public believe we should *not* be working towards fully-autonomous cars

> It seems with little prior soul-searching or at least consultation and debate, it was 'decided' that driverless cars are the future
>
> **Glenn Lyons, University of the West of England**

PUBLIC ATTITUDES NOW

A wealth of consumer research indicates there is little public appetite for driverless vehicles and studies in the past three years show little shift in attitudes.

The RAC Foundation in 2017 found that half (50%) of Britons are concerned about future driver-assistance technologies taking too much control away from the driver. This compares with just one-in-five (20%) who are unconcerned. And, indeed, there is a relatively small proportion of the British public who believe we should be actively working towards fully-autonomous cars (24% v 42% who believe we should not).

More recently, research conducted on behalf of the Institution of Mechanical Engineers – *Public perception:* ▶

▶▶ *Driverless Cars, Survey Results 2019,* found that:

- One-in-three adults think we will never switch to having only driverless cars on UK roads (note that two-thirds think we will – that 'inevitability' view again?).
- 60% of people say they would always prefer to drive themselves rather than use a self-driving vehicle.
- Two-thirds of people are uncomfortable with the idea of travelling in a driverless car.
- More people (32%) want driverless cars restricted to 30 mph, up from 27% in 2017.
- A third of men are comfortable about travelling in a driverless vehicle, less than one fifth of women are the same.
- Age is a major factor in attitudes – 42% of people aged between 18 and 24 are happy about being an occupant in a driverless car, compared with 11% of those aged 75 and over.
- Statistics show human driver error accounts for more than 90% of all accidents on the road.
- Men are twice as likely as women to say computers are better drivers – 16% compared with 8%.
- Scotland, Wales and the south-west are more cautious about driverless technology than the rest of the UK.

However, at the same time, there is recognition that, while driving is embedded in many people's lives, relatively few are heavily invested in the act of driving or enjoy motoring and so it is likely these views may be more fluid than the research suggests.

There is, for instance, an appetite for driver assistance – with around two-thirds of car-owning households having vehicles with at least one driver-assist feature including adaptive cruise control, lane departure detection, automatic emergency braking and automatic windscreen wipers .

The most detailed research into driver categories was the Transport Systems Catapult *Traveller Needs and UK Capability Survey* in 2015, which identified several categories of mobility needs.

It found that while 9% of the population identifies as a motorist who enjoys driving, a significant proportion of other categories of driver would contemplate (or be keen on) giving up their car if suitable alternatives existed.

Trends support this. Younger people are delaying getting their driving licences and driving less throughout their lives than the generations preceding them.

This indicates that there is potential for real change (and a threat to the current automotive business model).

9%

identify as a motorist who enjoys driving

THE ARGUMENTS *FOR* DRIVERLESS CARS

SAFER CARS

The vast majority of accidents and road deaths come down to driver error, and the most persuasive case for driverless cars is possibly that of safety.

Felicity Heathcote-Márcz, ethnographer and head of customer research propositions for the Atkins Consultancy Business, believes connected and autonomous vehicles (CAVs) offer a tremendous opportunity to engineer human error out of road traffic collisions and other incidents.

"According to recent big data studies by government agencies, between 85-95% of vehicle crashes anywhere in the world are caused by human error, which gives us a sense of the scale of change that level 5 automated vehicles could effect if and when they are fully implemented, particularly on the motorway network where crashes are most likely to happen at high speeds."

She envisages an inevitable progression to driverless cars and says: "We find many aspects of automation already integrated into new high spec vehicles. Future mobility consultants from Atkins and elsewhere argue that the added benefit of level 5 autonomy would be the integration with physical road infrastructure and other vehicles, therefore allowing CAVs to travel in very efficient convoy in CAV-only lanes. Eventually it will be highly unsafe to allow human-controlled vehicles to share road space with fully automated vehicles.

"This may sound dystopian to some driving lovers out there. However, as a researcher, I see this as a safety imperative for the future. I have completed research projects studying holiday driver behaviours, breakdowns on the motorways and major A roads in England and a broad range of road user groups and can categorically say that human drivers constantly engage in unsafe behaviours. In fact, we can characterise human drivers as a group as unsafe in a great many circumstances."

Heathcote-Márcz has found behaviours such as fatigue, speeding, tailgating, road rage and illegal activity such as drink- and drug-driving are common and significant factors in crashes and near misses.

"There's only so much society can do in terms of education campaigns and behavioural changes," she says. "In reality, the only way to eliminate the majority of fatalities and serious incidents on our roads is to automate the human out of the driving system. Extreme? Perhaps, but arguably highly effective if we can get the technology right, and change our culture to accept this profound cultural shift."

CONGESTION REDUCTION

In theory, driverless cars could organise themselves better to optimise their road use by 'platooning' (driving much more closely to utilise road space better) and by automatically rerouting to avoid congestion. Working with smart traffic control could further optimise road use and increase road safety.

REDUCED EMISSIONS

With cars optimising their routes they could, in theory, reduce emissions. Used as smart taxis or autonomous ride-share they could require a much smaller fleet to service travellers' needs although it is likely that AVs will be all-electric with zero emissions at tailpipe.

CHEAPER TRANSPORT

The costs of drivers and safety requirements (driver rest breaks etc.) are a major cost for transportation companies. Vehicles that drive themselves would cost less to operate enabling more, cheaper taxi and ride-sharing type services.

MORE ACCESSIBLE TRANSPORT

In theory, driverless cars mean no driving licence, so people of all ages and abilities could access mobility. There is great potential for enabling older people and those with disabilities to travel.

THE ARGUMENTS *AGAINST*

PUBLIC HEALTH

Cheaper and more accessible car travel will reduce the amount of active travel and exacerbate the public health crisis associated with sedentary lifestyles.

INCREASED CONGESTION

Cheap, driverless cars will clog streets looking for 'rides'. They could exceed demand and circle rather than park in a way currently associated with the Uber's London fleet. This would lead to car-clogged cities, where no amount of smart traffic management would compensate for the volume of vehicles on the road.

NO INVESTMENT JUSTIFICATION

Do you need a fully autonomous vehicle to eliminate crashes or simply a vehicle with extensive, intelligent autonomous systems? The latter would, effectively, eliminate crashes by stepping in to take preventative action, offering, potentially, a cheaper solution.

MORE INEQUALITY

If driverless cars were sold in the same way as existing personal cars (rather than as a service) they could exclude more people from car ownership and make mobility much less accessible to certain groups – particularly if regulation eventually excluded non-autonomous cars from public highways.

▲ **Driverless pods have been tested in the area around the O2 arena in Greenwich**

ENGAGING PEOPLE WITH DRIVERLESS VEHICLES
MERGE GREENWICH PROJECT

A 12-month Government-backed study, carried out by a consortium led by Addison Lee Group, Merge Greenwich, looked at the potential for autonomous vehicle ride-sharing to reshape urban transport.

Customer research found 85% of respondents would be willing to use AVs, believing the vehicles would be safe and appropriately regulated by the time they were available as part of a public service. However, only 46% said they would be willing to use a ride-sharing service regularly.

While this is still a significant number, the relative reluctance to share is underpinned by concerns about privacy, personal security and the social rules of being with strangers in a confined space with no driver. Women, in particular, had concerns. Public education, appropriate vehicle and service design as well as the option to have an on-board 'steward' should be considered as ways to overcome these concerns. The research indicates that a business model where more vehicles are shared has still got some way to go before people would accept it.

The consortium was keen to highlight the potential consumer and social benefits if this model could be achieved. The benefits are dependent on a number of factors, including a fall in the cost of vehicles and the right customer pricing to ensure appropriate shifts from other modes of transport.

It claims that in some scenarios, reductions of up to 43% can be achieved in travel times between homes and existing public transport hubs such as tube and rail stations, saving a commuter 3.5 days a year. In addition, thousands of unneeded car parking spaces could be repurposed as journeys requiring parking dropped by up to 38%.

TfGM CITIZENS' CONVERSATION

Greater Manchester (GM) has a number driverless vehicle projects planned, such as Project Synergy, which will trial autonomous vehicles between Stockport and the airport, as well as between airport terminals.

Salford City Council and the University of Salford are working on a project which will eventually see a driverless shuttle pod operating between the Peele Park and Media City campuses.

Transport for Greater Manchester (TfGM) is planning a process to engage with citizens over the development of the policy agenda and put the public at the heart of decision-making. It is hosting a Citizens' Conversation to provide context and understand public attitudes towards driverless vehicles and their potential use before the projects reach trial stage.

For the Conversation, 80 people will be invited to take part. The group will be balanced based on their demographics to ensure a representative sample.

Participants will be given a non-technical overview of driverless vehicle technology and how it might be used in GM – including a summary of some existing driverless vehicle trials that are taking place in the region, some of which TfGM is actively participating in.

They will be split into groups, each with a trained table facilitator (a member of TfGM staff) who will guide them through the sessions and ensure all members of the group have the opportunity to share their views.

The discussion will be recorded in a report which will describe the findings and detail attitudes to driverless vehicles in GM with specific information about concerns, ambitions and potential routes to success. The report will allow TfGM and regional partners to better understand public opinion around driverless vehicles and how different boroughs within GM may face different challenges and opportunities.

The feedback from residents will also support TfGM research projects such as Shuttles and Levitate that assess the impact of connected and autonomous vehicles on transport, personal mobility and decarbonisation.

The event ties in to key strategic objectives for TfGM and the 2040 Transport Strategy such as creating world-class connections that support sustainable economic growth, making transport accessible to all, and providing greener and more sustainable public transport modes, as well as mayoral priorities such as tackling pollution. ▶▶

80

people based on their diverse demographics will take part in TfGM's Citizens' Conversation

◀ **Will the steering wheel become a footnote in history?**

▶▶ **THE INSTITUTE OF MECHANICAL ENGINEERS**

A much more directional approach is suggested by the Institute of Mechanical Engineers which suggests the public will be persuaded if there are more trials with autonomous vehicles sharing the roads. This will allow people to experience these vehicles in action, validate the technology and increase public confidence. Areas such as business parks, airports, university campuses and potentially small towns could be used as controlled sites for autonomous vehicles.

It also recommends the Government accelerates the development of the regulatory framework for testing and use of autonomous cars, insurance liability, tax and revamped Highway Code to ensure clarity for road users in the near and longer term.

The industry and government should continue to collect data to assess driverless cars to show if the technology can deliver the safety, pollution and cost benefits it promises. This data could also be used to influence a shift from individual driver insurance towards vehicle insurance.

DRIVERLESS CARS EMULSION

Even within the transport sector there is a lack of exchange between those driving the driverless cars agenda and those concerned about how this technology could be prevented from having a negative impact. Lyons developed the Driverless Cars Emulsion to engage both groups in this conversation.

The format deliberately focuses people on the potential extreme outcomes of driverless vehicles – the potential driverless utopia or dystopia. By focusing groups on discussing how both utopias or dystopias might come about, sessions create a dialectic style discussion which brings out ideas to mitigate the potential for dystopia.

As Lyon puts it: "If we are going to have driverless cars, let's properly understand why we should have them (to save lives?, to improve people's lives? to save the car industry?, to save the economy? to...) and reach a determination on whether and why driverless cars might be the right solution for the problem at hand. If the different constituencies come together, their combined expertise and understanding holds the prospect of a much stronger foundation upon which to proceed with how to develop and implement driverless cars."

This process is one which enables people with different perspectives to engage with each other on both concerns and potential.

"Innovation really flourishes when the arts and sciences come together. Or in other words, innovation is a socio-technical phenomenon requiring an understanding of the social and the technical systems and how they interact," says Lyons. "Driverless cars are a complex phenomenon and to weigh up whether and how they can be created and diffused into society calls for multiple perspectives and inter-disciplinary approaches being brought to bear. If the in group ignores the out group, it is missing some key ingredients. If the out group ignores the in group, it denies development of driverless cars the benefit of its wisdom and might even be deemed complicit if a driverless car future does arrive and is more dystopian than utopian."

Both the content and form of the discussion is important and seems to create an opportunity for engagement that is more open ended and creative than assuming that there is a single path to driverless technology and its deployment.

PERSUADING THE PUBLIC?

One thing very clear when discussing autonomous vehicles is that the assumptions on which positive benefits rest depend very much on the ground that is laid now and how attitudes develop.

It is not just about whether individual consumers feel comfortable in adapting and switching to driverless vehicles, it is about whether they are prepared to share rides and see autonomous vehicles as part of public and shared transport.

The enthusiasts see cheap and efficient autonomous shared rides and extensions of public transport as the potential upside of driverless revolution. Yet this requires a great deal more public engagement and government involvement than simply replacing fleet with driverless cars.

It involves an increase in trust in the public transport network – the expectation that services (especially local buses) will work so expectation transfers to future autonomous services.

It means that work to normalise sharing now – enabling people to try demand-responsive transport, lift-sharing and car clubs – will pay dividends in future attitudes to shared autonomous vehicles.

The risk is that we follow the current path and exchange mass ownership of cars for mass ownership of driverless cars. This is the clearest path to a driverless dystopia.

Equally, any shared driverless fleet would need to cover a better network than that currently offered by buses and be less exclusive (and expensive) than the taxi fleet if it's not to exclude people from its benefits. And it would need to integrate with mass transit if it's not to clog the roads with cars.

In short, working with the public to develop the kind of transport network we want now – possibly as much through regional conversations as national ones – will set the direction for the introduction of driverless vehicles.

Creating a broader discussion – engaging all elements of society in establishing 'how we can create a framework that ensures driverless cars bring the benefits to society and the environment we would like to see' – seems like a better way forward than persuading (or browbeating) us to accept and use something we currently have little appetite for. **ST**

▲ **Having a local bus service people can rely on will allow trust to transfer to future autonomous services**

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43%

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