

PUBLIC PERCEPTIONS: DRIVERLESS CARS.

Institution of
**MECHANICAL
ENGINEERS**

**SURVEY RESULTS
2019**



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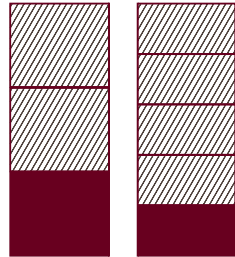
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CONCLUSION

PUBLIC PERCEPTIONS: DRIVERLESS CARS – KEY FINDINGS OF 2019 SURVEY



One in three adults think we will never switch to having only driverless cars on UK roads



A third of men are comfortable about travelling in a driverless vehicle, less than one fifth of women say the same



Two thirds of people are uncomfortable with the idea of travelling in a driverless car



Scotland, Wales and the South West are **more cautious** about driverless technology than the rest of the UK

60%

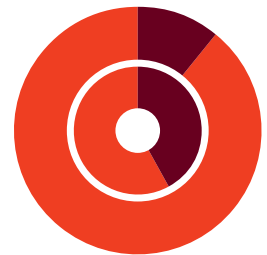
of people say they would always prefer to drive themselves rather than use a self-driving vehicle



Men are **twice as likely** as women to say computers are better drivers – 16% compared with 8%

32%
27%

More people **(32%)** want driverless cars restricted to **30 mph**, up from 27% in 2017



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 11% for those aged 75 and over



Statistics show human driver error accounts for over **90% of all accidents** on the road

RECOMMENDATIONS

1. More Trials

We need to see 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.

2. Regulatory Framework

The Government must accelerate the development of the regulatory framework for testing and use of autonomous cars to ensure clarity for road users.

3. Collecting data

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.

01

KEY POINTS

- / **One in three** adults think we will never switch to having only driverless cars on UK roads
- / **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 say 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 11% for those aged 75 and over
- / Statistics show human driver error accounts for over **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

RECOMMENDATIONS

1. We need to see 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.
2. The Government must accelerate 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.
3. 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. These data could also be used to influence a shift from individual driver insurance towards insurance for the vehicle.

The poll was carried out by ICM and surveyed 2,014 adults in the UK in July 2019.

02

PUBLIC PERCEPTIONS: DRIVERLESS CARS

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 may have in reducing emissions, easing congestion as well as improving safety and mobility.

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 success of the technology will depend on whether consumers feel comfortable in adapting and switching to driverless vehicles.

The Institution of Mechanical Engineers has long supported the vision and opportunity presented by driverless cars. This summer it launched the first autonomous vehicle competition at its annual Formula Student event to encourage students to develop the engineering and software skills that will be needed in the move towards a driverless world.

While the technology is advancing rapidly, progress towards fully autonomous vehicles that can drive everywhere will be gradual.

It is likely that there will be many years of transition before we see the start of an era where driverless cars can go anywhere and are integrated into our existing transport infrastructure. Forecasts by some in the industry that this would happen relatively quickly have proved over-optimistic.

While regulation and legislation are progressing in the UK, there is still a long way for the regulatory landscape to go to cover all issues that will be raised by autonomous vehicles.

Table 1. Levels of autonomy and where we are now.

Driver Control	The driver is completely in control but there are some automated systems	/ Cruise Control / Anti Lock Braking System / Electronic Stability Control	
Assisted Driving	The steering and/or braking and acceleration are automated but the driver controls other functions	/ Cruise Control / ABS / ESC	/ Autonomous Emergency Braking / Adaptive Cruise Control / Parking and Lane Keep Assistance
WHERE WE ARE NOW			
Partial Autonomy	The steering, braking and acceleration are automated and require no intervention from the driver However, the driver needs to be on standby and must take control of the car if needed	/ Cruise Control / ABS / ESC / AEB / Adaptive Cruise Control / Parking and Lane Keep Assistance	/ Adaptive Cruise Control with lane keeping / Traffic Jam Assistance
STEP CHANGE			
High Autonomy	The vehicle can travel autonomously in certain scenarios, for example on motorways or within certain areas	/ Cruise Control / ABS / ESC / AEB / Adaptive Cruise Control / Parking and Lane Keep Assistance / Adaptive Cruise Control with lane keeping / Traffic Jam Assistance	/ Road following / Junction decisioning / Hazard detection and evasive decisioning / Mapping of other road users, intention prediction monitoring and decisioning / Ethical decisioning
Full Autonomy	The vehicle completes the journey with no human intervention	Technical and public confidence	Technical and public confidence

Industry experts say one of the main difficulties is developing software that will be able to anticipate reliably what other drivers, pedestrians and cyclists are going to do. We have already seen news that a self-driving car being tested last year by Uber in Arizona killed a woman walking a bicycle across a road. These early use incidents have knocked the industry's confidence and raised consumer concerns.

Companies including General Motors and Waymo, which is owned by Google's parent company, Alphabet, had announced plans to launch driverless taxi services in several cities in the US by next year. However, since the Arizona crash the companies have continued to test their self-driving vehicles but are now reluctant to say when they plan to launch commercial ride services.

In the meantime, drivers of new vehicles are being increasingly exposed to autonomous technology as assisted driving becomes more widespread. Many of today's cars are being fitted with technologies which can assist or assume control of basic vehicle functions such as cruise control, parking assistance and steering support. As drivers use these systems, they will become more confident with them and see the benefits autonomous systems can bring and learn how it can best be used.

With the growing interest in self-driving cars, the Institution of Mechanical Engineers commissioned research in July 2019 to see if public attitudes had changed since we released the first Public Perceptions: Driverless Cars report in 2017.

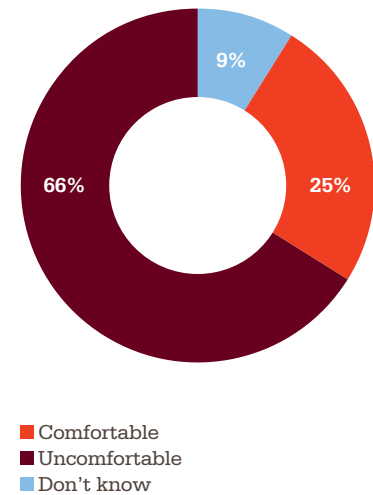
The Institution commissioned ICM Unlimited to ask eight questions to 2,014 members of the public which covered the key issues of:

- Acceptance of the technology
- Specific concerns regarding driverless technology
- Trust and capabilities of human drivers
- The possibility of a switch to only autonomous cars on UK roads

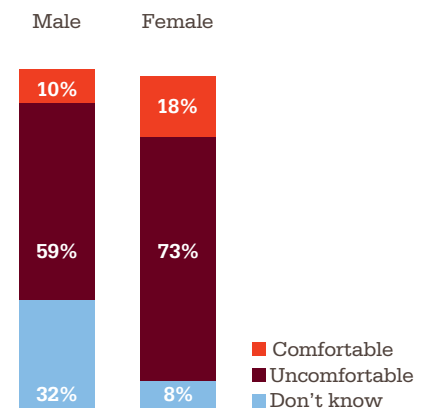
In broad terms, the poll found men, younger people and those with a higher formal education level are more comfortable, open and optimistic about the idea of autonomous vehicles than their respective counterparts.

There was also a regional difference with people in Scotland, Wales and the South West being more cautious about driverless cars than those in the rest of the UK.

Graph 1. How comfortable would you be travelling in a driverless car at 70 mph with no human intervention?



Graph 2. By Gender



03

TRAVELLING IN AN AUTONOMOUS CAR

The public remains wary of autonomous vehicles, influenced by media stories especially the news of the Uber car accident in Arizona. Fewer people are comfortable with the idea of travelling in an autonomous car than two years ago and more would like the vehicles to be restricted to driving no faster than 30 mph.

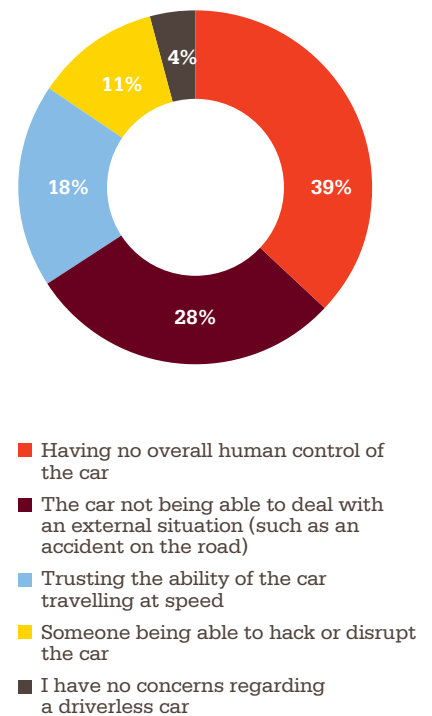
The poll found the number of people saying they would be comfortable falling to 25% from 27% in 2017. Two thirds of people are uncomfortable with the idea of travelling in a driverless car, the same level as two years ago (graphs 1 and 2).

More people favour tighter speed limits for autonomous cars, with the number saying they should be allowed to drive at the permitted speed falling to 35% from 40% two years ago. More interviewees (32%) want driverless cars restricted to 30 mph, up from 27% in 2017.

There is considerable variation by age and gender. A third of men are comfortable about travelling in a driverless vehicle, less than one fifth women say the same.

The poll showed 42% of people aged between 18 and 24 are happy about being an occupant in a driverless car, compared 11% for those aged 75 and over.

Graph 3. What would be your biggest concern travelling in a driverless car?



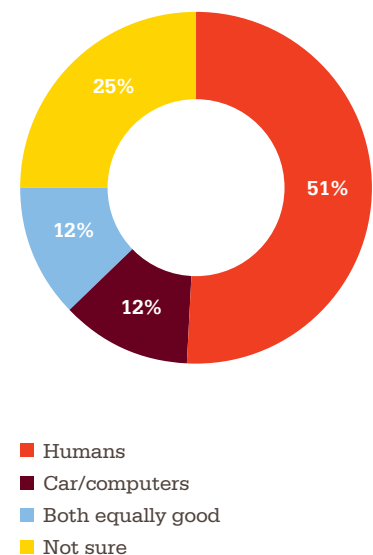
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HUMAN VS COMPUTER

There was an increase in the number of people saying their biggest concern is the lack of human control, which is unsurprising given the widespread news coverage of the Arizona crash. This year's poll found that 39% of people said this was their main concern, up from 36% two years ago (graph 3).

Statistics show human driver error accounts for over 90% of all accidents on the road, but despite this half of the people interviewed said humans were better drivers (graph 4). Men are twice as likely as women to say computers are better drivers – 16% compared with 8%. Equally, more women than men are unsure – 29% versus 21. The large percentage of people who are unsure, which is almost unchanged from two years ago, suggests that people may be open to the idea that driverless cars could be a safer transport option in the future.

Graph 4. Who do you believe are better drivers of cars?



DRIVERLESS FUTURE

The public is sceptical about a move to a completely driverless age. Three in ten adults say there will always be human-driven cars on UK roads and we will never switch to only having autonomous cars.

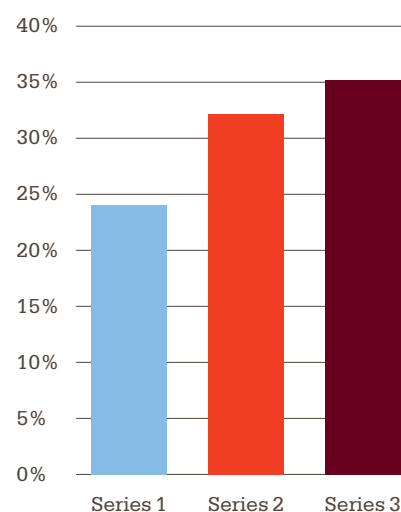
Interestingly, non-drivers were more likely (35%) than drivers (29%) to say they thought we would never switch totally to autonomous cars.

Younger people and those with higher education and higher income were more confident that all cars would eventually be driverless (graphs 5 and 6).

Most people's clear preference is to drive themselves – whether this is for the pleasure of driving or a lack of confidence in and experience of autonomous technology. Men and women felt equally about this but there is a notable age gap in the preferences, with three quarters of 65 to 74-year olds saying they wanted to drive themselves compared with nearly half of 18 to 24-year olds.

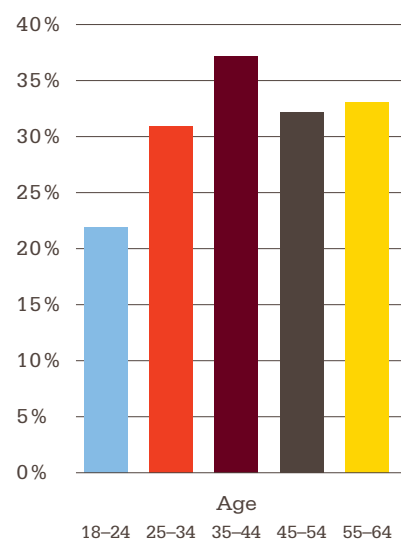
Younger people and those with a higher level of education showed greater preference for driverless cars. A quarter of 18 to 24-year olds say they would choose an autonomous vehicle, while about one in ten 55 to 64-year olds say the same. One in six people with a university degree would choose a self-driving car compared with one in ten with a secondary school education level.

Graph 5. People who think we will never switch to only having driverless cars. Attitudes by annual income.



Series 1 – Income £41,000 and over
Series 2 – Income £21,000 to £41,000
Series 3 – Income up to £21,000

Graph 6. People who think we will never switch to only having driverless cars. By age.



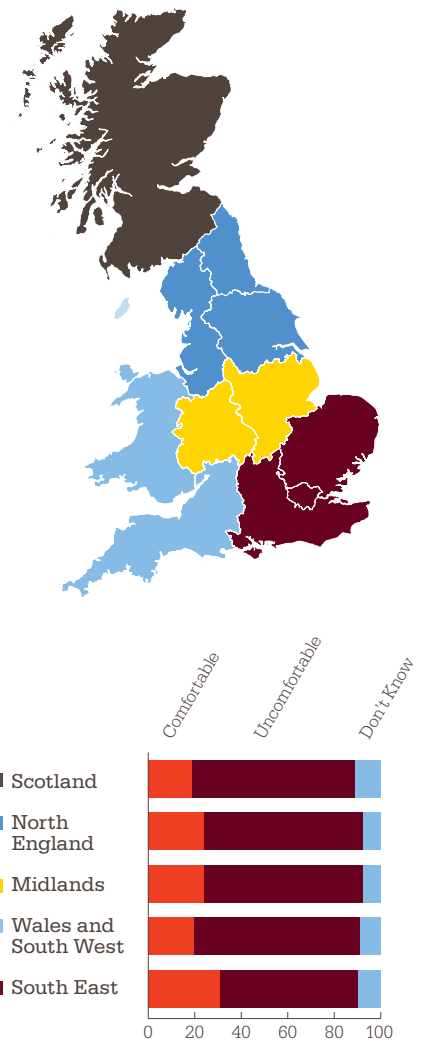
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REGIONAL DIFFERENCES

There were notable regional variations in the findings. The South East is most optimistic and Scotland the most cautious – with 31% of people open to the idea of driverless cars in the South East compared to 19% in Scotland. In Wales and the South West, 20% of adults are comfortable with driverless technology with 71% unhappy about it.

People in the Midlands and the North were also cautious with only 24% in both regions relaxed about the idea of travelling in an autonomous car.

Graph 7. Attitudes by region.*



*Northern Ireland was not included in the poll.

07

CONCLUSION

It's clear we are many years away from ushering an age of driverless cars and there is considerable consumer resistance to the concept. Consumer concerns have been influenced by media stories especially the news of the Uber car accident in Arizona.

In this poll, people have shown a strong preference for driving their own cars and one in three believe that we will never move to having only autonomous cars on the road.

The research highlighted significant differences on the acceptability of driverless cars when analysed by age demographic. People who have been driving successfully, and without incident for decades, may take some convincing that a driverless car can undertake such a complicated task safely and efficiently. Women are more cautious about the technology than men and are much less likely to say they feel comfortable with the idea of travelling in an autonomous vehicle.

However, opinions could change as more drivers become more familiar with autonomous systems as driver assistive technology becomes more common in a wider range of vehicles. Industry experts say this assistive technology will grow incrementally, allowing drivers to gain confidence and learn how to use it better.

The pilot trials of driverless vehicles on the streets of Edinburgh and London which are due to take place by 2021 will give people first-hand experience of autonomous vehicles in action.

The trials are subject to rigorous safety assessments and the Government hopes they will build consumer confidence as well as cement the UK's position as a world leader in automated vehicle trials. Although the trials are limited in scope, they are a positive first step towards showing the public the social, environmental and safety benefits this technology could offer in the future.

The government has said that the UK's market for connected and automated vehicles could be worth £52 billion by 2035. This is huge opportunity and challenge and we need to sure the UK has the engineering and manufacturing skills to take advantage of the strong growth expected in the autonomous vehicle market.