

Automated Vehicle Survey #3

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Thank you for participating in the first and second rounds of this survey. In Survey 1 we received 1,123 responses, and in Survey 2, we received 681 responses.

We have some more questions for you, based on what we have learnt so far.

We have to obtain your ethical consent again, then we will start the survey.

As you may recall, this study uses a multi-stage approach to examine expectations of the future effects of automated vehicle (also called autonomous, driverless and self-driving vehicles) diffusion on energy demand and greenhouse gas emissions for passenger and road freight transport in the UK.

This is the third and final survey in which we will build upon what we found in the first and second surveys, and provide some details back to you.

No background knowledge about automated vehicles is required for this study.

The information collected will be collated and used to inform academic publications, policy briefs and presentations. Members of the research team will have access to the data, but not your name or other personal details. No third parties will be given access to any of the data. The anonymised data will be deposited in specific repositories as required by the research funders (UK Research Councils).

Please read through these terms before agreeing to participate by ticking the 'yes' box below. You may ask any questions before taking part by contacting Dr Debbie Hopkins: debbie.hopkins@ouce.ox.ac.uk.

Please note that your participation is voluntary. You may withdraw at any point during the questionnaire for any reason, before submitting your answers, by closing the browser.

Your answers will be completely anonymous, and we will use our best endeavours to keep them confidential. Your data will be stored in a password-protected file and may be used in academic publications. Research data will be stored for a minimum of three years after publication or public release.

Research is a task that we perform in the public interest. Further information about your rights with respect to your personal data is available from <http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/>

We will not be asking for your name or other identifiable information in the survey.

Toluna UK Limited, with whom you have signed up as a panel member, is the data controller with respect to your personal data and, as such, will determine how your personal data is used. Please see the privacy notice you accepted when you became a Toluna member [<https://uk.toluna.com/privacy>]. The 'Online Survey Provider' is Jisc Online Surveys who will only have access to survey responses and will share only fully anonymised data with the University of Oxford, for the purposes of research.

Any personal information that could identify you will be removed or changed before files are shared with other researchers or results are made public.

Responsible members of the University of Oxford and funders may be given access to data for monitoring and/or audit of the study to ensure we are complying with guidelines, or as otherwise required by law.

This project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee Reference number: SOGE 1A 20-19.

If you have a concern about any aspect of this project, please speak to the researcher [Dr Debbie Hopkins, Debbie.hopkins@ouce.ox.ac.uk], who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the relevant Chair of the Research Ethics Committee at the University of Oxford: Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD. The Chair will seek to resolve the matter in a reasonably expeditious manner.

1. You may only participate in this survey if you are 18 years of age or over.

☐ I certify that I am 18 years of age or over

2. If you have read the information above, and agree to participate with the understanding that the data (including any personal data) you submit will be processed accordingly, please check the relevant box below to get started with the survey. Please note: you are required to answer all questions.

- ☐ Yes, I agree to take part
- ☐ No, I do not wish to take part

Page 2: Electrification

In the second survey, we found that over half of respondents (54%) thought that electric vehicles would be 'very important' to help resolve the environmental impacts of passenger transport. This was higher than any other technological solution we suggested, including alternative fuels (39%), real-time information for public transport (35%), electronic ticketing for buses and trains (25%) and automated vehicles (20%).

A similar trend occurred with technologies for freight transport too, with 47% of respondents stating that electric vehicles would be 'very important' to help resolve the environmental impacts, followed by alternative fuels (42%), smart motorways (24%), automated vehicles and smartphone Apps for wayfinding (both 21%).

3. Have you ever driven a battery electric vehicle (as the driver)?

- ☐ Yes
- ☐ No
- ☐ I am not sure

3.a. Was the experience of driving a battery electric vehicle...

- ☐ Very positive
- ☐ Positive
- ☐ Neutral
- ☐ Negative
- ☐ Very negative

4. Have you ever driven a plug-in hybrid vehicle (as the driver)? Note: a plug-in hybrid vehicle has a socket and can be charged with an electric cable, as well as a fuel tank for petrol or diesel.

- ☐ Yes
- ☐ No
- ☐ I am not sure

4.a. Was the experience of driving a plug-in hybrid vehicle...

- ☐ Very positive
- ☐ Positive
- ☐ Neutral
- ☐ Negative
- ☐ Very negative

5. Have you ever ridden in a battery electric vehicle (as a passenger)?

- ☐ Yes
- ☐ No
- ☐ I am not sure

5.a. Was the experience of riding in a battery electric vehicle...

- ☐ Very positive
- ☐ Positive
- ☐ Neutral
- ☐ Negative
- ☐ Very negative

6. Have you ever ridden in a plug-in Hybrid vehicle (as a passenger)? Note: a plug-in hybrid vehicle has a socket and can be charged with an electric cable, as well as a fuel tank for petrol or diesel.

- ☐ Yes
- ☐ No
- ☐ I am not sure

6.a. Was the experience of riding in a plug-in hybrid vehicle...

- ☐ Very positive
- ☐ Positive
- ☐ Neutral
- ☐ Negative
- ☐ Very negative

7. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I do not intend to buy or lease a vehicle
For my next vehicle I want to buy or lease a battery electric vehicle	☐	☐	☐	☐	☐	☐
For my next vehicle I want to buy or lease a plug-in hybrid vehicle	☐	☐	☐	☐	☐	☐
I would seriously consider leasing or buying a battery electric vehicle or plug-in hybrid vehicle if I need a new vehicle	☐	☐	☐	☐	☐	☐
I feel a strong personal obligation to buy or lease a battery electric vehicle for my next vehicle to reduce carbon emissions and improve air quality	☐	☐	☐	☐	☐	☐
People who are important to me expect me to choose a battery electric vehicle or plug-in hybrid vehicle for my next vehicle	☐	☐	☐	☐	☐	☐
Battery electric vehicles and plug-in hybrid vehicles do not come in the size or shape of car that suit my needs (e.g. too small for family)	☐	☐	☐	☐	☐	☐

8. Please indicate whether you agree or disagree with the following statements about battery Electric Vehicles (EVs):

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I like the sound and power of a conventional car engine	☐	☐	☐	☐	☐

When driving a battery EV, I would always be worried about running out of charge	☐	☐	☐	☐	☐
Because of my own principles, I feel that I should choose a battery EV for my next vehicle to reduce carbon emissions and improve air quality	☐	☐	☐	☐	☐
Over the longer term, battery EVs are a cheaper option than a diesel or petrol vehicle	☐	☐	☐	☐	☐
I don't know where I could charge a battery EV near my home	☐	☐	☐	☐	☐
Many of the people who are important to me (friends, family) own fuel efficient and environmentally friendly cars	☐	☐	☐	☐	☐
Battery EVs are too expensive to purchase	☐	☐	☐	☐	☐

9. Please indicate whether you agree or disagree with the following statements about Plug-in Hybrid Electric Vehicles (PHEVs):

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I like the sound and power of a conventional car engine	☐	☐	☐	☐	☐
Because of my own principles, I feel that I should choose a Plug-in Hybrid Electric Vehicle for my next vehicle to reduce carbon emissions and improve air quality	☐	☐	☐	☐	☐
Over the longer term, Plug-in Hybrid Electric Vehicles are a cheaper option than a diesel or petrol vehicle	☐	☐	☐	☐	☐
I don't know where I could charge a Plug-in Hybrid Electric Vehicle near my home	☐	☐	☐	☐	☐
Plug-in Hybrid Electric Vehicles are too expensive to purchase	☐	☐	☐	☐	☐

Page 3: Shared Electric Vehicles

In survey 2, we found that more respondents agreed (47%) than disagreed (22%) that they might use a 'car club' vehicle, if the latter was a very low emission vehicles (e.g. electric or hybrid). The same was found for shared taxi services, with 47% of respondents agreeing or strongly agreeing that they might use a shared taxi if it was a very low emission vehicle, and just 20% disagreeing.

You may remember from the previous survey, that we discuss sharing in terms of: 1. a 'car club' where you become a member of the club, hire a car for a specified time when you need it, and pick it up from a designated parking bay or at a location indicated by the scheme's website or app, and 2. a shared taxi where you get into a vehicle at the same time as one or more other persons (e.g. UberPool).

10. Are you a member of a car club?

- ☐ Yes
- ☐ No

10.a. Does your car club have electric vehicles (battery electric or hybrid)?

- ☐ Yes
- ☐ No
- ☐ I don't know

10.a.i. Does your car club have full battery electric vehicles?

- ☐ Yes
- ☐ No
- ☐ I don't know

10.a.ii. Does your car club have plug-in hybrid vehicles?

- ☐ Yes
- ☐ No
- ☐ I don't know

10.a.iii. Does your car club have 'traditional' hybrid vehicles (no need to plug in - the battery is charged by regenerative braking and petroleum)?

- ☐ Yes
- ☐ No
- ☐ I don't know

10.b. Please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I intend to join a car club that allows me to drive EVs as soon as one is locally available	☐	☐	☐	☐	☐
I plan to join a car club in order to reduce the number of vehicles in my household	☐	☐	☐	☐	☐
I plan to join a car club that has EVs	☐	☐	☐	☐	☐

I would be more willing to replace our second vehicle (rather than main vehicle) with membership of a car club with electric vehicles	☐	☐	☐	☐	☐
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11. Below are a number of statements about electric **car club** vehicles, please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I would be willing to pay slightly more (10%) to use an electric car club vehicle than a conventional (non-electric) car club vehicle	☐	☐	☐	☐	☐
I would be willing to pay substantially more (25%) to use an electric car club vehicle than a conventional (non-electric) car club vehicle	☐	☐	☐	☐	☐
I would expect an electric car club car to be cheaper than a regular petrol/diesel-powered car club vehicle	☐	☐	☐	☐	☐
If an electric car club vehicle was 80% of the cost of a petrol/ diesel-powered car club vehicle I would choose the EV all or most of the time	☐	☐	☐	☐	☐

12. Below are a number of statements about electric **shared taxi** vehicles, please indicate whether you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I would be willing to pay slightly more (10%) to use an electric shared taxi than a conventional (non-electric) shared taxi	☐	☐	☐	☐	☐
I would be willing to pay substantially more (25%) to use an electric shared taxi than a conventional (non-electric) shared taxi	☐	☐	☐	☐	☐
I would expect an electric shared taxi to be cheaper than a petrol/ diesel-powered shared taxi	☐	☐	☐	☐	☐
If an electric shared taxi was 80% of the cost of a petrol/ diesel-powered shared taxi, I would choose the EV all or most of the time	☐	☐	☐	☐	☐

Page 4: Shared Electric and Fully Automated Vehicles

In survey 2, we found that more respondents agreed (38%) than disagreed (29%) that they might use a car club if the club had vehicles with automated features (e.g. adaptive cruise control, lane assist, automatic parking).

The second survey showed that the shared taxi vehicle being fully automated (i.e. with no human driver) might make half (49%) of the respondents not want to use these taxis.

13. Thinking about the following automated features for car club vehicles, how important do you think they would be for the transport system in terms of: a) reducing fuel consumption, b) increasing safety? Please select two answers per row.

	Reducing fuel consumption					Increasing safety				
	Very important	Important	Neutral	Unimportant	Very unimportant	Very important	Important	Neutral	Unimportant	Very unimportant
Adaptive/ dynamic cruise control (the vehicle automatically adjusts its speed to maintain a safe distance from vehicles ahead)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lane assist (automatic warning if the vehicle leaves its lane)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Automatic parking (autonomous system which moves vehicle from traffic lane by performing parallel, perpendicular, or angle parking)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Emergency braking	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

14. In the next set of questions, we are interested in why you think the British public, and why you, might be interested in using electric car club vehicles which have automated features. Automated features might include *adaptive cruise control* - where the vehicle adapts its speed to the surrounding traffic automatically, or *automatic parking* - where the vehicle can parallel park without any human intervention. There are many different automated features available in new cars today. Please read the sentences below, and indicate whether you think these reasons might make you, and other people, to join and use electric car club vehicles which have automated features.

	For the British public				For you personally			
	Yes	Maybe	No	I am not sure	Yes	Maybe	No	I don't want to use a car club vehicle
To try out new technologies before purchasing a car with those features (e.g. adaptive cruise control, automatic parking)	☐	☐	☐	☐	☐	☐	☐	☐
To drive a newer car than the car normally driven	☐	☐	☐	☐	☐	☐	☐	☐
Because of the novelty of the automated features	☐	☐	☐	☐	☐	☐	☐	☐
Because it is cheaper than owning an electric vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it is more convenient than owning an electric vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it creates less air pollution than owning an electric vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it has lower carbon emissions than owning an electric vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it is cheaper than using a conventional (non-EV) car club vehicle	☐	☐	☐	☐	☐	☐	☐	☐

Because it is more convenient than using a conventional (non-EV) car club vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it creates less air pollution than using a conventional (non-EV) car club vehicle	☐	☐	☐	☐	☐	☐	☐	☐
Because it has lower carbon emissions than using a conventional (non-EV) car club vehicle	☐	☐	☐	☐	☐	☐	☐	☐

15. As noted above, respondents were hesitant about using fully automated shared taxis, how important do you think the following concerns and uncertainties are for explaining their hesitancy?

	Very important	Important	Neutral	Unimportant	Very unimportant
Concerns about behaviour of other passengers in the vehicle	☐	☐	☐	☐	☐
Concern about traffic safety and interactions with other vehicles	☐	☐	☐	☐	☐
Concerns that there is no driver available to offer support in situations where this might be needed	☐	☐	☐	☐	☐
Uncertainty about what the automated vehicle technologies can do, and what they can not do	☐	☐	☐	☐	☐
Concerns about cyber security and the possibility that automated vehicles might be hacked	☐	☐	☐	☐	☐

16. What, in your opinion, might make fully automated shared taxi vehicles more desirable?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
If fully automated shared taxis were 50% cheaper than human-driven shared taxis	☐	☐	☐	☐	☐
If fully automated shared taxis were 25% cheaper than human-driven shared taxis	☐	☐	☐	☐	☐
If I knew a human somewhere was monitoring a camera that records the inside of the vehicle	☐	☐	☐	☐	☐
If I knew that, if needed, an operator in a control room could take over and operate the vehicle from a distance	☐	☐	☐	☐	☐
If they were programmed to avoid streets and intersections with many pedestrians and cyclists	☐	☐	☐	☐	☐
If they only used segregated lanes (like a bus lane)	☐	☐	☐	☐	☐
If I could accept/decline who to share the ride with on the basis of their online profile before I board the vehicle	☐	☐	☐	☐	☐

If the algorithm only matched my ride with that of one or more passengers of gender(s) and age range I have selected in my online personal preferences



Page 5: Changes to Your Behaviours

17. Do you, or does anyone within your household own or lease any vehicles (cars, motorbikes, mopeds)?

Please select exactly 1 answer(s).

☐ Yes

☐ No

17.a. How many vehicles are owned or leased by people within your household?

☐ 1

☐ 2

☐ 3

☐ 4+

17.a.i. We are now going to ask you some questions about the vehicles used by you and those in your household.

	Is the vehicle a...				Is the vehicle...			What is the make and model of this vehicle?	When you got this vehicle, was it first or second hand?		For how long?	
	Car	Motorbike	Moped	Van	Owned	Leased	A work vehicle		First hand (from new)	Second hand (from the previous owner)	Less than one year	1-3 years
First vehicle	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐
Second vehicle	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐
Third vehicle	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐
Fourth Vehicle	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐

18. Imagine you would be spending less money by using shared, electric and/or electric vehicles, would you spend the saved money on the following items or activities?

	You				Other adults (18+) in your household				
	Yes, definitely	Probably yes	Probably not	Not at all	Yes, definitely	Probably yes	Probably not	Not at all	Not applicable
Flying on a holiday more frequently than usual	☐	☐	☐	☐	☐	☐	☐	☐	☐
Travelling by car more often (rather than using other transport modes such as the train or the bus)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Travelling longer distances by car (rather than using other transport modes such as the train or airplane)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Turning on the heating at home when a jumper would have been put on previously	☐	☐	☐	☐	☐	☐	☐	☐	☐
Not paying attention to fuel efficient driving when using the vehicle	☐	☐	☐	☐	☐	☐	☐	☐	☐

Replacing existing or buying new consumer goods (e.g. clothing/footwear, smartphone, games consoles)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Taking out a more expensive data plan (mobile devices) or faster broadband (at home)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Buying more online services (e.g. video streaming)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Spending more on eating out, the pub, meetings with family and friends	☐	☐	☐	☐	☐	☐	☐	☐	☐
Spending more on existing hobbies	☐	☐	☐	☐	☐	☐	☐	☐	☐
Spending more on days out or weekends away	☐	☐	☐	☐	☐	☐	☐	☐	☐
Installing solar panels and other energy saving investments in the home	☐	☐	☐	☐	☐	☐	☐	☐	☐
Saving the money in a bank account	☐	☐	☐	☐	☐	☐	☐	☐	☐

19. Please read the following statements and indicate whether you agree or disagree.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Not applicable
If I become a member of a car club, then I expect to walk, cycle and use public transport more often than I currently do	☐	☐	☐	☐	☐	☐
If I was travelling in an automated vehicle, I could cover more mileage in my daily routine than I did previously	☐	☐	☐	☐	☐	☐
An automated vehicle might mean I could live further from work than I currently do as I could relax on the commute	☐	☐	☐	☐	☐	☐
I can see that, once I have successfully switched to an EV, I might be more willing to try out other energy-saving or low-carbon technologies (e.g. Solar panels on the roof)	☐	☐	☐	☐	☐	☐
I would use an automated vehicle for short journeys which I currently take by walking, cycling or public transport	☐	☐	☐	☐	☐	☐
Because shared, electric automated vehicles are better for the environment than other types of cars, I would not need to make environmentally-conscious decisions in other areas of my life	☐	☐	☐	☐	☐	☐

Page 6: Policy Options

20. Below are three **priorities for national (UK) transport policy**. We would like you to use 100 points in total to indicate your level of support for these priorities. Please allocate more points for the priorities you think are more important, and less points for those that you think are less important. Over the three priorities listed below, your answers should add up to 100. Example: 20 'enhancing economic growth', 30 'reducing transport's contribution to climate change and poor air quality', 50 'reducing social inequality and increasing accessibility'

	The three boxes should add up to 100
Enhancing economic growth	
Reducing transport's contribution to climate change and poor air quality	
Reducing social inequality and increasing accessibility	

21. Below are three **priorities for national (UK) transport policy for reducing consumption of fossil fuels**. We would like you to use 100 points in total to indicate your level of support for these priorities. Please allocate more points for the priorities you think are more important, and less points for those that you think are less important. Over the three priorities listed below, your answers should add up to 100. Example: 60 'cleaner fuels', 30 'promoting public transport, cycling and walking', 10 'reducing travel through promotion of working from home and e-services'

	The three boxes should add up to 100
Cleaner fuels (including electric vehicles)	
Promoting public transport, cycling and walking	
Reducing travel through promotion of working from home and e-services	

22. Below are three **priorities for national (UK) policy for vehicle automation**. We would like you to use 100 points in total to indicate your level of support for these priorities. Please allocate more points for the priorities you think are more important, and less points for those that you think are less important. Over the three priorities listed below, your answers should add up to 100. Example: 90 'automation in freight transport', 10 'individually owned automated vehicles for passenger transport', 0 'shared and automated services for passenger transport'.

	The three boxes should add up to 100
Supporting and facilitating automation in freight transport	
Supporting and facilitating individually owned automated vehicles for passenger transport	
Supporting and facilitating shared and automated services for passenger transport	

Page 7: Final page

Thank you for completing all three of our surveys about automated vehicles!

We really appreciate the time you have dedicated to responding to our questions.

Thank you again.

Please click [here](#) to end the survey.
