

Professional Delphi on Automated Vehicles #1

Questions

January 2020

In this survey, we will refer to the [Society of Automotive Engineer's \[SAE\] levels of automation](#), which were updated in 2018. Please click [here](#) to be directed to the SAE website for details of the levels and how these have changed since their previous iteration. We have briefly outlined the six levels below, for your reference.

- **SAE Level 0:** Driver support features, limited to warnings and momentary assistance. Examples include: Automatic emergency breaking, Blind spot warning, and lane departure warning
- **SAE Level 1:** Driver support features, provide steering OR break/acceleration support. Examples include: Lane centering OR adaptive cruise control
- **SAE Level 2:** Driver support features, provide steering AND break/acceleration support. Examples include: Lane centering AND adaptive cruise control
- **SAE Level 3:** Automated driving features, can drive the vehicle under limited conditions, and only if all conditions are met. Examples include: Traffic jam chauffeuring
- **SAE Level 4:** Automated driving features, can drive the vehicle under limited conditions, and only if all conditions are met. Examples include: Local driverless taxi, pedals/ steering wheel may or may not be installed
- **SAE Level 5:** Automated driving features, can drive the vehicle under ALL conditions. Examples include: driverless vehicles which can drive everywhere in all conditions.
- For further details, please read the [SAE taxonomy](#).

In this survey, we are talking specifically about **ground/road-based automated vehicles**, excluding aerial, rail and water-based automated vehicles. Our surveys relate to **both passenger and freight vehicles**.

For many of the questions, we include a **certainty scale** (from very uncertain to very certain), for you to express your certainty relating to the answer you have provided.

1. What term do you most comfortably use to describe what we are calling an 'automated vehicle'?

- Autonomous vehicle
- Connected and autonomous vehicle
- Driverless vehicle
- Self-driving vehicle
- Robotic vehicle
- Other (please specify)

2. What are you thinking of when you use this term? Please explain below.

[Free text]

If required, please refer to the [Society of Automotive Engineer's \[SAE\] levels](#) of automation by clicking here. We use '**15% of new vehicle sales**' as a measure as a 'middle of the road' scenario, similar figures are presented in various scenarios and analyses from [KPMG](#), [SMMT](#) and others. We will discuss this percentage further in subsequent rounds of the Delphi survey.

As above, we use '15% of new vehicle sales' as a measure as a 'middle of the road' scenario, similar figures are presented in various scenarios and analyses. We will discuss this percentage further in subsequent rounds of the Delphi survey. Note: SAE Level 4: Automated driving features, can drive the vehicle under limited conditions, and only if all conditions are met. Examples include: Local

driverless taxi, pedals/ steering wheel may or may not be installed

For further details, please refer to the [Society of Automotive Engineer's \[SAE\] levels of automation](#).

3. When do you expect 15% of new PASSENGER vehicle sales to have... SAE Level 1 Automation; SAE Level 2 Automation; SAE Level 3 Automation; SAE Level 4 Automation; SAE Level 5 Automation

- 2019-2029
- 2030-2039
- 2040-2049
- 2050-2059
- 2060+
- Never

3a. How certain are you about this?

- Very uncertain
- Uncertain
- Slightly uncertain
- Slightly certain
- Certain
- Very certain

4. When do you expect 15% of new FREIGHT vehicle sales to have: SAE Level 1 Automation; SAE Level 2 Automation; SAE Level 3 Automation; SAE Level 4 Automation; SAE Level 5 Automation

- 2019-2029
- 2030-2039
- 2040-2049
- 2050-2059
- 2060+
- Never

4a. How certain are you about this?

- Very Uncertain
- Uncertain
- Slightly uncertain
- Slightly certain
- Certain
- Very certain

5. What type of vehicle and use do you think will diffuse fastest on UK roads? (each will require different degrees of vehicle automation)

- Platooning motorway trucks
- Mini-bus systems (SAE Level 4)
- Cars for regular passenger transport (SAE level 5)
- Buses and coaches (SAE Level 4 or 5)
- Pavement-based delivery pods
- Delivery vans (SAE Level 4 or 5)
- Passenger taxi service (SAE Level 4)

6. Please rank Level 4 automated PASSENGER vehicles in terms of likely benefits (0=not likely – 7=extremely likely); Magnitude of benefits (1=no impact – 7=maximum); Certainty of benefits (1=very uncertain – 6=very certain)

- Road Safety

- Carbon emission reductions
- Energy demand reductions
- Air pollution
- Accessibility
- Cost savings

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- Road Safety
- Carbon emission reductions
- Energy demand reductions
- Air pollution
- Accessibility
- Cost savings

8. Please rank the possible negative externalities of Level 4 automated PASSENGER vehicles in terms of likelihood of occurring (0=very unlikely – 7=extremely likely); magnitude if occurring (1=no impact – 7=maximum); certainty of occurring (1=very uncertain – 6=very certain)

- Resulting in increased vehicle miles
- Negative impact on other modes (e.g. decreased public transport use)
- Impact on urban planning, design and development (e.g. sprawl)
- Resulting in increased energy use
- Resulting in more traffic congestion
- Resulting in more private vehicle ownership
- Resulting in less physical activity

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10. What are the barriers to the diffusion of SAE Level 4/5 PASSENGER automated vehicles?

- Road infrastructure
- Governance
- Legal frameworks
- Technological capabilities
- Connectivity infrastructure
- Public acceptability
- Other (please list in comment box)

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- Road infrastructure
- Connectivity infrastructure
- Legal frameworks
- Technological capabilities

- Public acceptability
- Governance
- Other (please list in comment box)

12. Who do you think are the most important people/ groups/ organisations in accelerating the diffusion of automated vehicles in the UK?

- Local government
- Lobby groups
- Consortia
- National government
- International innovators
- UK-based innovators

12a. Please use the comment box to add any other groups that should be included in this list.

13. What might be game changer(s) for the rapid diffusion of automated vehicles?

14. On balance, do you think that UK mass media reporting of vehicle automation has been:

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

15. Do you think media reporting has changed over time?

- Yes, how? (open text)
- No
- Maybe

16. Please rank the following features/ attributes according to their likelihood to result in energy demand reductions in PASSENGER transport.

- Changed ownership models (e.g. increased sharing of vehicles and services)
- Automation of the driving task
- Alternative fuels
- Mode shift (e.g. from car to train/bus)

17. Please rank the following features/ attributes according to their likelihood to result in energy demand reductions in FREIGHT transport.

- Changed ownership models (e.g. increased sharing of vehicles and services)
- Automation of the driving task
- Operational efficiencies
- Mode shift (e.g. from lorry to train)
- Alternative fuels

EXPERTISE AND DEMOGRAPHIC CHARACTERISTICS

1. What are your areas of expertise? Please tick all that apply:

- Transport (passenger)
- Transport (freight)
- Transport (other)
- Energy
- Environment
- Robotics
- Artificial intelligence

2. Which of the following best describes your expertise?

- Technology/ engineering
- Policy
- Economics
- Social science (e.g., behaviour)
- Other (please specify)

3. To which place does your expertise relate? Please tick all that apply:

- England
- Wales
- Scotland
- Northern Ireland
- Regional (e.g. county-level)
- Urban (e.g., city/ town-level)
- Global
- Republic of Ireland
- UK

4. By what type of organisation are you employed?

- Government
- Consultancy
- Business
- Academia
- Other (please specify)

5. How many people do you line manage?

- None
- 1-3
- 4-8
- 9-15
- 16-30
- 31+

6. How long have you been in this role?

- Less than 2 years
- 2-5 years
- 5-10 years
- 10+ years

7. How long have you been with your current (primary) organisation?

- Less than 2 years
- 2-5 years
- 5-10 years
- 10+ years

8. What is your highest educational qualification?

- High School/ Secondary School or equivalent
- Undergraduate degree or equivalent
- Postgraduate certificate/ diploma
- Master's degree
- PhD/ doctorate
- Other (Please specify)

9. What is your age (in years)?

- Below 40
- 40 or above
- Prefer not to say

10. What gender do you identify with?

- Female
- Male
- Self describe
- Prefer not to say

Thank you for completing this short survey. You can re-enter the survey while it remains open, and adjust any of your answers. You can also see how other panel members have responded.

Once the survey closes, we will be analysing the data, and then we will develop the second survey which we will then invite you to respond to.

The second survey will develop the ideas from this survey, and use the analysed data as a basis for a deeper-dive into some of the topic areas.

If you have any questions or comments before then, please email: [deleted] or use the comment box below.