Connected and automated mobility study

Call for evidence

NATIONAL INFRASTRUCTURE COMMISSION
Better infrastructure for all

April 2024

Our remit

The Commission provides government with impartial, expert advice on major long term infrastructure challenges.

The Commission's objectives are to:

- support sustainable economic growth across all regions of the UK
- improve competitiveness
- improve quality of life
- support climate resilience and the transition to net zero carbon emissions by 2050.

In fulfilling our purpose and objectives, we:

- **set a long term agenda** – identifying the UK's major economic infrastructure needs, and the pathways to address them
- **develop fresh approaches and ideas** – basing our independent policy recommendations on rigorous analysis
- **focus on driving change** – building consensus on our policy recommendations, and monitoring government progress on their delivery.

A fuller description of the Commission's remit can be found on our website at nic.org.uk/about/what-we-do/. This includes a table of devolved administration responsibilities by infrastructure sector.

Members of the Commission


Sir John Armitt (Chair)


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Full biographies can be found on our website at nic.org.uk/about/the-commission/

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Introduction

The government has asked the National Infrastructure Commission to provide recommendations on the infrastructure policy interventions needed to ensure that connected and self-driving technologies can best support sustainable economic growth across all regions of the UK, improve competitiveness and quality of life, and support climate resilience and the transition to net zero carbon emissions.

Automation and connectivity could present opportunities for delivering improvements to road safety, reducing congestion, improving reliability and accessibility of transport services, and increasing productivity. Through the Automated Vehicles Bill, the government is putting in place a legal, regulatory and safety framework to help support the market for self-driving vehicles. The Commission will consider what interventions in addition to this framework may be necessary to enable and maximise benefits, and to mitigate any risks.

The Commission has been asked to consider the following points in particular:

- the additional policy, governance and infrastructure that may be required, reflecting the uncertainty about technological development; this includes physical and digital infrastructure, as well as network management, operations and implementation of any policies and recommendations
- the use for private cars, taxis and private hire vehicles as the primary focus, but also including use cases involving public transport and freight/logistics, and differentiating between road types, and urban, interurban and rural contexts where appropriate
- the costs, benefits and associated risks and dependencies of different infrastructure requirements, including distributional impacts, bearing in mind implications for security, equality, diversity and inclusion within the transport system
- the sequencing and prioritisation of any interventions, and the extent to which they are robust to uncertainty.

The terms of reference for the study were published in February 2024 and can be found **here**.

As part of this study, the Commission will produce the following:

- an interim report in summer 2024 which sets out the areas of focus for the study
- a final report in early 2025 which will provide recommendations to government on how to maximise the possible benefits of connected and automated technologies.

A note on language

The title for this study is 'Connected and automated mobility'. The Commission is following the government in understanding this phrase to refer to the broad set of vehicle technologies that can be used in wheeled (non-rail), ground-based vehicles.[1]

The ability of a vehicle to drive itself is a specific application of connected and automated mobility technologies. The Commission takes the government's definition of a 'self-driving vehicle' as one that has at least one self-driving feature, delivering sufficiently high levels of automation that it meets a legally defined threshold and is capable of safely driving itself with no human input. The Automated Vehicles Bill is introducing a legal definition of self-driving vehicles on this basis.[2]

The Society of Automotive Engineers International has established six levels of driving automation.[3] Self-driving vehicles as defined above refer to vehicles with levels three to five capability. This is therefore a narrower term than 'automated vehicle', which can refer to technologies (levels one and two) which are not capable of self-driving.[4]

When referring to self-driving vehicles below, the Commission assumes that these will also be connected vehicles. A connected vehicle is one that uses any of a number of different communication technologies to communicate with the driver, other vehicles on the road, roadside infrastructure and to other systems and services via the cloud.

While the focus of the Commission's study is on self-driving vehicles, the Commission is also interested in the benefits that vehicle and roadside connectivity could bring separately or in addition to any role in supporting the operation of self-driving vehicles.

Questions

The Commission is seeking evidence in five areas. The bullet points underneath the questions are intended as prompts for issues and areas that you may want to consider in your response to the main question, rather than separate questions to answer individually.

The Commission does not expect all respondents to answer every question, and would encourage those with a particular interest in only some of the areas to focus their response on those questions. If you are able to share any work on relevant uptake/rollout scenarios, we would welcome being made aware of these as part of your answers.

Freight

1. **What opportunities and risks could self-driving vehicles present for freight and logistics?**

Areas you may wish to cover in your response include:

- To what extent do self-driving vehicles for freight provide an opportunity for cost savings for retail and business customers?
- How do the opportunities and risks vary between urban and interurban environments?
- Are there any barriers to realising the benefits – for example around how customers would interact with automated deliveries – and how could these be addressed?

Personal mobility – for individuals and small household-sized groups

2. **What are the opportunities and risks that privately owned or individually leased (e.g. as part of a car club type arrangement) self-driving vehicles, and self-driving ride-hailing or ride-pooling services (taxi type), could bring to households and to wider society?**

3. **What are the different trajectories for uptake and which do you think is most likely?**

Areas you may wish to cover in your response include:

- To what extent do you anticipate a shift from the private ownership model of vehicles to the Mobility as a Service model, which makes more use of shared and public transport services alongside active travel?
- How do you expect the cost of self-driving vehicles – both the upfront cost and ongoing maintenance costs – to change over time?
- How might uptake and impacts vary across different geographic areas?
- How would the widespread adoption of self-driving vehicles be expected to affect congestion in urban areas?
- How would active travel and public health be affected by the widespread adoption of self-driving vehicles?

Public transport

4. **What are the opportunities and risks for public transport from self-driving vehicles?**

Areas you may wish to cover in your response include:

- What new public transport services could automation or connectivity enable, for example in rural areas or disconnected neighbourhoods?
- What is the scope for self-driving vehicles to reduce the costs of public transport services and enhance their attractiveness?
- How might the availability of self-driving vehicles for personal mobility (see section above), affect demand for public transport?
- To what extent could revenues from public transport and service levels be affected by uptake of these technologies within and beyond the public transport sector?
- Are there any interventions that may be needed to ensure affordable public transport, or ride-sharing/ride-pooling options, remain available?

Infrastructure for optimisation of usage

5. **Self-driving vehicles are expected by the legal framework to operate with existing road conditions and current levels of digital connectivity. But are there specific interventions in relation to physical highway infrastructure and/or digital connectivity that could enable greater benefits from the use of self-driving vehicles on urban or interurban roads?**

Areas you may wish to cover in your response include:

- Is there a case for dedicated lanes or other segregation of self-driving vehicles, on interurban or urban roads, to help traffic flow and reduce congestion?
- How will self-driving vehicles interact with fleet decarbonisation (e.g. charging) infrastructure?
- Are there any interventions required to maximise the possible benefits that vehicle-to-vehicle, vehicle-to-infrastructure, and vehicle-to-cloud connectivity could provide?
- If there is a widespread adoption of self-driving vehicles, to what extent will the provision of mobile connectivity to meet the demand for data – both from people in vehicles and the vehicles themselves – be a concern?
- How will vehicles that don't have connected or self-driving capabilities benefit or otherwise be affected by infrastructure change designed to support those that do?

General

6. **We are interested in the impacts that self-driving vehicles could have on different groups in society, including those with protected characteristics recognised by equalities legislation.[5] To what extent could they help address existing inequalities and improve transport inclusion, including for people who are unable to drive due to a disability or age?**

Areas you may wish to cover in your response include:

- Are there any issues around personal safety to consider?
- How will impacts vary across different income groups?
- Are there other interventions necessary to enable and maximise benefits?

7. **Are the benefits that may be secured from autonomy and connectivity inevitably intertwined or could they be separated?**

Areas you may wish to cover in your response include:

- Are connected rather than automated features more important for some use cases?
- Are policy and infrastructure interventions the same for optimising connectivity and automated benefits?

8. **What effect might the adoption of self-driving vehicles have on carbon emissions from the transport sector?**

Area you may wish to cover in your response:

- What additional measures might be required to ensure that they contribute to meeting emissions targets for 2035 and 2050?

How to respond

Please provide sources and references, examples, data and evidence to support your response. We encourage responses to be as succinct as possible and to be no longer than six pages in total (not including supplementary supporting evidence, which should be provided in an annex if required).

Responses should be sent to **CAMstudy@nic.gov.uk** by the end of **Monday 3 June 2024**.

Evidence received will be reviewed by the Commission. If further information or clarification of any evidence submitted is required, the Commission Secretariat will contact the evidence provider.

The Commission is not planning to accept responses to the call for evidence in hard copy. Please contact the Commission by the email address above if this poses a problem for your response. Representative groups responding to this call for evidence are asked to give a summary of the people and organisations they represent and, where relevant, who else they have consulted in reaching their conclusions when they respond.

FoI and privacy statements

There may be occasions when the Commission will share the information you provide, including any personal data, with external analysts. This is for the purposes of call for evidence response analysis only. The Commission's privacy policy can be found **here**.

We may also publish any responses received to this call for evidence, excluding personal data. However, information provided in response to this call for evidence, including personal information, may be subject to publication or disclosure in accordance with the Freedom of Information Act 2000 (FOIA) or other relevant legislation.

If you want information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory code of practice with which public authorities must comply and which deals, amongst other things, with obligations of confidentiality. In view of this, it would be helpful if you could explain to the Commission why you regard the information you have provided as confidential. If the Commission receives a request for disclosure of the information, it will take full account of your explanation, but cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Commission. The Commission is subject to legal duties which may require the release of information under the Freedom of Information Act 2000 or any other applicable legislation or codes of practice governing access to information.

References

1 HM Government (2022), **Connected & Automated Mobility 2025**, page 21

2 House of Commons Library (2024), **Automated Vehicles Bill [HL] 2023-24**

3 SAE International (2019), **Levels of Driving Automation**

4 HM Government (2022), **Connected & Automated Mobility 2025**, page 21

5 HM Government (2015), **Equality Act 2010: Guidance**

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