

Written evidence submitted by Stagecoach (SDV0044)

Introduction

1. Stagecoach is Britain's biggest bus and coach operator, providing local bus networks and inter-urban bus and coach connections. We operate around 7,900 vehicles connecting over 100 communities across the UK through 19 regional Bus Operating Companies under the Stagecoach brand.
2. We have been active in developing autonomous driving technologies for buses for a number of years and are currently participating in two autonomous vehicle (AV) projects, working with technology partners. The evidence below focuses in particular on the customer and operational aspects of autonomous bus services, based on our experience of operating local bus services throughout the UK.
3. Whilst much of the focus of policy and project work on autonomous vehicles has focused on automotive applications for passenger cars, we believe that bus services are well suited for the application of autonomous technologies as bus routes are typically predictable, planned in advance and on suitable roads. That said, passenger safety will be critical given the larger number of passengers carried on board an autonomous vehicle and the size of a typical service bus means the interaction with other road users will be more complex.

Stagecoach involvement in autonomous bus projects

4. Stagecoach has been involved in three autonomous bus projects to date:
 - **Sharston Depot (2018-2019)** – this self-funded project trialled the use of autonomous technologies for depot operations, with a prototype single-deck bus that could drive itself around a depot at the end of a shift. It could get fuel, go through the bus wash and park itself up for the night all at the push of a button, with the potential to increase the safety of our depot operations by removing people from the vehicle movement area.
 - **CAVForth (2019-2023)** – funded by the Centre for Connected and Autonomous Vehicles (CCAV), this project will launch the UK's first autonomous bus service later this year, using five full-sized single deck buses, capable of AVL 4 autonomous driving on a registered bus service

running in East Scotland connecting Ferrytoll Park and Ride in Fife with Edinburgh Park transport interchange. The project has been undertaken by a consortium led by Fusion Processing, with project partners Alexander Dennis, Stagecoach, Edinburgh Napier University, Bristol Robotics Lab and Transport Scotland. A key element of the project has been to explore and understand customer attitudes to autonomous buses, and some of the initial findings will be discussed below.

- **HiTrans Shuttle (2022-2023)** – In March, Stagecoach successfully bid for a contract from the transport partnership, Hitrans, to operate an autonomous shuttle around Inverness Campus in collaboration with AV supplier Navya. The trial will deploy level 3 technology on a slow-speed pod-type vehicle later this year.

Evaluation of the benefits of autonomous buses

5. The CAVForth project has enabled the consortium to consider how an autonomous bus should work in practice to improve bus travel for bus passengers. Through the trial, we will be able to put this new model into practice and monitor the technologies' abilities and benefits. By comparing these to indicators from existing routes, the project will be able to establish if autonomous technology is worth the additional cost of implementation over traditionally operated bus services. In developing the project, the consortium has identified a number of potential benefits of deploying autonomous technologies on buses that the project will test, including:
 - Improved safety by reducing the number of road traffic accidents as a result of human error
 - Better fuel efficiency by optimising driving style for the conditions to deliver maximum fuel efficiency
 - An enhanced customer experience through a consistent and smooth driving style

Customer attitudes to autonomous buses

6. As part of the CAVForth project, Edinburgh Napier University surveyed existing bus passengers about their attitudes to autonomous buses prior to the autonomous bus service starting operations. Whilst there was moderate interest in autonomous buses amongst respondents (with 51% expressing interest), few felt well informed about them. Those surveyed

perceived the potential benefits to be a reduced impact on the environment, increased frequency and new routes, and improved road safety. There were however concerns about the safety of autonomous buses, particularly cybersecurity risks and the ability of the vehicle to detect other road users.

7. The survey also considered the role of on-board staff in addressing customer concerns. The survey found that customers were much more willing to consider using an autonomous bus service if the service was staffed to monitor the vehicle's operations and to provide customer service. This suggests that customers remain to be convinced about autonomous technology that would lead to the absence of on-board staff. Wider stakeholder engagement in the project has also raised concerns about the value or lack of social benefit in investing in a technology that could lead to the removal of driver jobs. To respond to this, the CAVForth bus service will include a 'bus captain' to monitor the operation of the autonomous technology and intervene if required, as well as providing support and reassurance for customers. The support of on-board staff will be particularly important in ensuring that autonomous bus services remain accessible for all, particularly given the accessibility challenges of the current bus stop infrastructure.
8. Depending on the outcome of the project, this suggests that the role of on-board staff will change over time as autonomous technologies are increasingly deployed on bus services, with the focus shifting away from driving duties to providing customer service and ensuring accessibility, but that an on-board staff presence will still be required in the future. The research also suggests that any wider deployment of autonomous technologies needs to be clearly communicated, expressed around wider societal and environmental benefits rather than just focusing on the technology involved.

Priorities for Government action

9. **Innovation funding:** The Government funding support for autonomous vehicle trials has been critical and will need to continue. Whilst autonomous technology on passenger cars may be approaching commercial viability, this is not the case for other vehicle types and further support for development and commercialisation will be needed. This is particularly the case for

autonomous buses as the costs of development would be spread across a relatively small UK bus fleet of around 33,000 vehicles.

10. **Supply chain development:** The development of a robust and competitive supply chain for vehicle manufacturers and AV systems providers will be important in ensuring that automation makes commercial sense in a variety of use cases. Components need to be designed for use in AV systems, and critical systems such as steering and braking systems require back-up systems in case of failure. Wider deployment of autonomous technologies will require a reorientation of the existing supply chain and the Government should continue to support the development of a competitive supply chain through the Automotive Transformation Fund and other funding streams.
11. **Convening role:** Our experience of AV projects to date is that successful delivery requires close co-operation between the wide variety of partners, including highways authorities, local transport authorities, and the emergency services. Government – whether at local or national level – are well placed to use their convening powers to bring together the various public bodies required to deliver an AV project.
12. **Regulatory framework:** The Law Commission has already been considering the changes required to regulation to reflect and support the deployment of autonomous technologies. As well as changes to general vehicle regulation, changes may well be required to specific PSV/HGV regulation to reflect the wider use of autonomous technologies, such as for example, driving hours or tachograph requirements. Further work is required to understand the changes that may be needed.
13. **Public messaging:** The customer survey work in the CAVForth project suggests that there is a low awareness of autonomous technologies in the general public and the need to express the benefits of wider use of those technologies in wider societal terms. Customer awareness and acceptance of autonomous technologies is likely to be greater barrier to wider deployment than the regulatory framework. Working in partnership with commercial operators and manufacturers, there is a role for Government to support the public messaging around autonomous technologies as an objective and authoritative voice.
14. **Modal shift:** Delivery of the Government's transport decarbonisation objectives will depend on delivering a shift in transport modes away from private car use to lower carbon modes of transport, including public, shared and active transport. There is a risk that deployment of AV technologies in

passenger cars to improve the driver experience may encourage private car use and hinder the modal shift to lower carbon transport. The Government should ensure that its policy on connected and autonomous vehicles supports the transition to lower carbon modes of transport and consider further policy interventions to accelerate that transition.

15. Local authority engagement: Only with a real-life use case in practice can the technology be tested for both practical and commercial viability. The Government should work with local authorities to encourage them to consider autonomous vehicle trials as part of their wider 'Smart Cities' programmes.

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