Written evidence submitted by the RAC Foundation (SDV0026)

Inquiry: The development and deployment of self-driving vehicles

From the RAC Foundation August 2022

The RAC Foundation is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users. The Foundation publishes independent analysis and research with which it seeks to promote informed debate and advocate policy in the public interest taking the perspective of the responsible motorist.

Self-driving vehicles

This is a huge topic. There are many possible ways in which self-driving technology could be developed for on-road use in the UK. This has been acknowledged in the extensive study conducted by the Law Commissions and we welcome the fact that the Government's response to their recommendations is supportive.

Rather than try to cover all possible eventualities we have restricted this note to three topics.

1. Likely uses/levels of autonomy

It is clear that the development of automated driving systems could apply to many forms of vehicle, not just the private car, and that the degree of automation on offer could vary from full end-to-end trip making (though whether that could be a reality for all trips in all circumstances seems doubtful) down to more constrained circumstances such as a passenger shuttle service operating on a tightly defined circuit, or a system that could be triggered by a driver whilst in motion, akin to the operation of 'cruise control' as already provided on many modern cars.

The issue we'd invite the Committee to probe is whether enough thinking is being done to consider the overall system architecture into which the automated vehicle would fit. It is true that an automated vehicle could provide mobility to people who are unable to drive, for example due to a disability, but how is the person going to access the vehicle if, as may be the case, they find moving difficult? It is hard to see how, by itself, an automated vehicle could perform the same functions as, say, a minicab driver in assisting a passenger. This needs to be addressed if the societal benefits of greater inclusion and mobility for all are to be realised.

In a similar vein a delivery vehicle could be automated but there remain the tasks of loading and unloading to be thought through.

On a different tack, it is possible to envisage a future bus or coach service being programmed to operate autonomously thus saving the cost and operational issues involved with employing a human driver, but could that service instead be enhanced by employing a conductor e.g. to provide assurance to passengers who might otherwise not feel safe on a night service?

2. Concerns

Our principal concern is with the design of vehicle systems that provide less than full autonomy – for example a more advanced version of the automated lane-keeping system already headed to production vehicles that would allow the human driver to hand full control to the vehicle whilst on a motorway, such that the vehicle can change lanes and overtake other vehicles, but where the vehicle could seek to return control to the human driver e.g. as it approaches the designated junction for leaving the motorway or in circumstances where, for some reason, the automated system is finding it impossible to decide the appropriate course of action. We think the system architecture needs to allow for the possibility that the human 'driver' is not in a position to retake control because they are distracted or, in extremis, asleep. The vehicle will need sensors to establish the readiness of the human to retake control but also programming that would allow it to proceed to a place of safety if it decides control should not be handed over, which would more sensibly be the next motorway service area rather than the hard shoulder or an emergency refuge. We have yet to be reassured that this thinking is being adopted by those designing autonomous systems, rather than assuming that it would be sufficient to put an obligation on the human driver to stay awake, alert and ready to re-take control swiftly.

Second, there will be circumstances where coding an automated system will be extraordinarily difficult, for example what the vehicle should do at a junction in a built-up area where pedestrians choose not to give way to the vehicle (possibly because they can tell it is operating autonomously) or at a junction where visibility is limited. In such cases a human driver would be exercising judgement and caution – edging forward – in a way that could be hard to build into instructions for an automated system.

Third, whilst it is possible to see considerable safety benefits arising from the introduction of self-driving vehicles that are not prone to the shortcomings of human drivers, likely as it is that they will be programmed always to obey the rules of the road, wide-scale benefits are likely to accrue only from wide-scale adoption of the technology, meantime policy-makers need to plan for what could potentially be a long period where self-driving vehicles will be mixing with human-driven vehicles.

3. Roadworthiness

We have a well-established construction and use regime for establishing the roadworthiness of road vehicles in their design, checking the conformity of vehicles offered for sale with the approved design, and then testing that the vehicle has been maintained in a roadworthy condition. The development of self-driving technology poses a particular challenge to this regime because it now needs to establish not only the physical integrity of the vehicle and its compliance with established standards but also how the automated system responds to a wide variety of circumstances, in effect adding a layer of assessment more akin in principle to the driving test we have for human drivers than a more mechanically-based approach.

It is possible that using computer-based virtual environments, based on real-world examples, self-driving systems could be subjected to a very wide range of circumstances to test their reactions – far more than the limited range that can be incorporated into the physical driving test for human drivers (a driving test taken in the summer is unlikely to check how a driver copes with snowfall) – which could deliver a safer outcome. The challenge will be both in designing and running those virtual testing environments and, for the regulatory authorities, designing an approach that in turn can check and validate how well testing based on virtual environments works in practice.

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