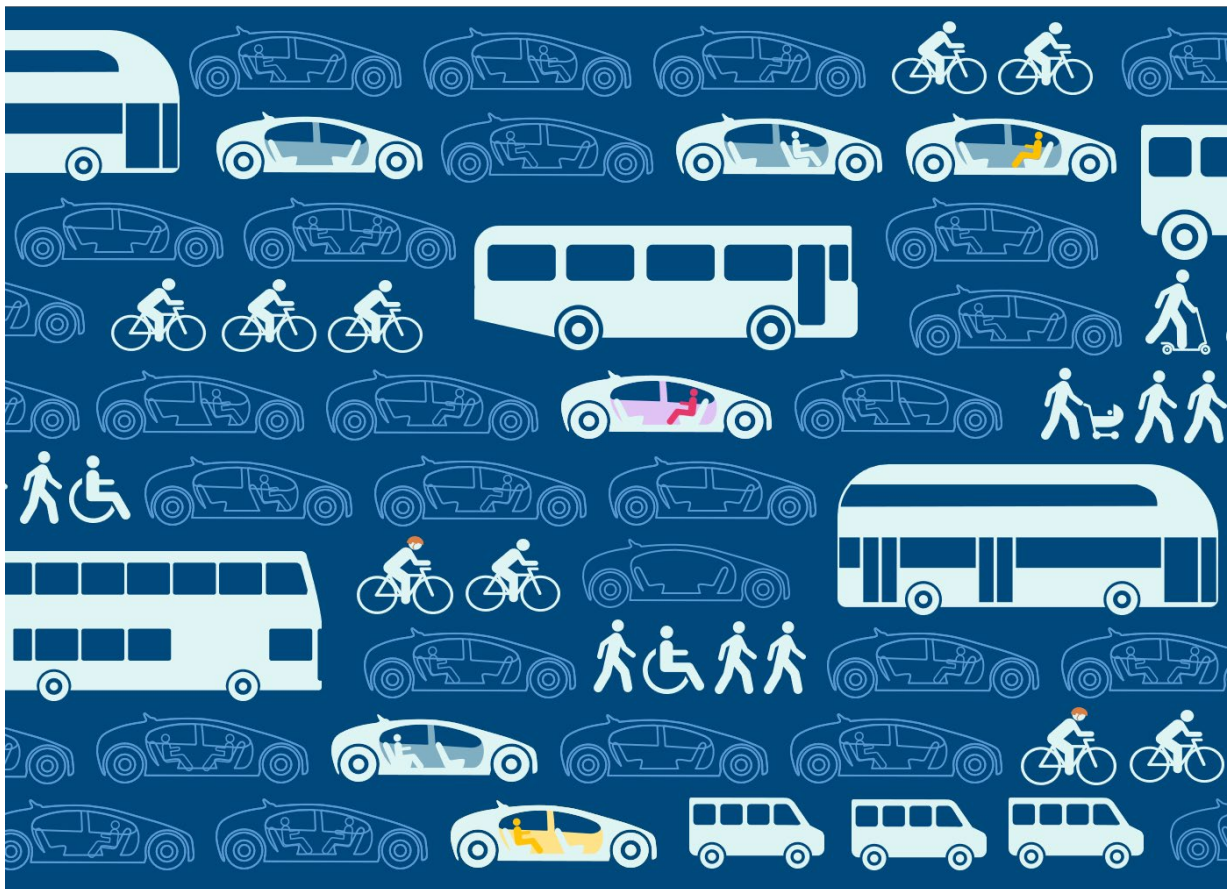




# Automated Vehicles:

## Summary of responses to Consultation Paper 3 and next steps





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## A. Introduction

- A.1 This document reports on the third round of consultation in a review of automated vehicles (AVs) by the Law Commission of England and Wales and the Scottish Law Commission. It also invites input on a draft impact assessment.
- A.2 In 2018 the Centre for Connected and Autonomous Vehicles asked us to review the legal framework for the deployment of AVs in Great Britain (GB). Our first consultation paper, in November 2018, focused on safety assurance and legal liability. Our second paper looked at how AVs would be able to provide Highly Automated Road Passenger Services (or HARPS) within a public transport network, together with the challenges of regulating vehicles without a responsible person on board.
- A.3 In December 2020 we published a third consultation paper focusing on the legislation needed to address the immediate challenges ahead. The paper asked 58 questions, and was accompanied by a shorter summary and overview. We received 117 responses.
- A.4 This interim document provides a brief overview of what people told us in those responses. It sets out the next steps for the project and indicates the direction of travel on some key policy areas. To continue promoting informed debate and engagement in the lead up to the final report, we are also publishing the responses we received on our website at the same time as this summary.
- A.5 We will continue working with the detailed input received during this consultation to help us develop policy right up to our final recommendations. We intend to publish a much fuller analysis of responses, including quotations from responses and detailed discussion of consultees' views, alongside our final report at the end of the year. Nothing in this document should be taken as representing the decided views of either Law Commission. Conclusions and recommendations will be set out in our final report.
- A.6 Our final report will include an impact assessment. We recognise the many unknowns regarding the development of self-driving technology, its capabilities and social acceptance. Alongside this paper we publish a draft impact assessment. In the draft we ask questions about the possible impact of the law reform options put forward in our third consultation and welcome feedback from stakeholders. We will use the input received to finalise the impact assessment that will accompany our final report.
- A.7 We would like to thank all those who took the time to speak with us and responded to our consultations. We appreciate the investment of time and energy this involved, particularly in light of the added pressures of COVID-19. We look forward to further opportunities to discuss policy beyond the formal consultation process, at meetings and conferences, as we progress towards the final stages of this project.
- A.8 We continue to work collaboratively with CCAV. The scope of our review is broad but not all-encompassing. Important areas such as the privacy implications of data collection for AVs and the ethics of AV-decision-making are outside our terms of

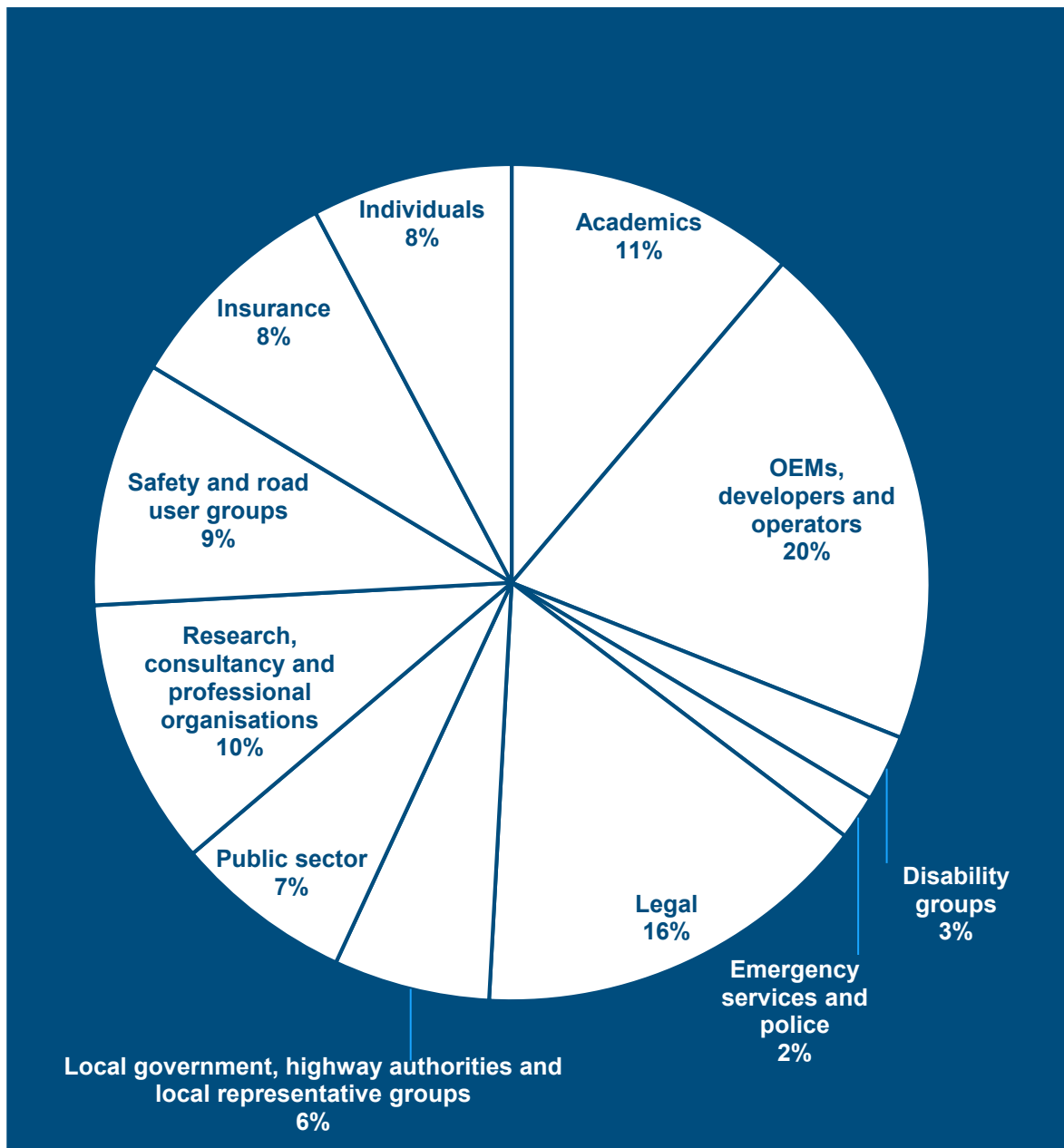
reference. Further, many of the proposals we consulted on depend on the development of detailed technical specifications. These include what scenarios should be included in the test database, what measures to use for ‘bad driving’ as part of in-use monitoring, and full requirements on what data needs to be recorded. We note the work that Government is doing in these areas as part of its CAVPASS safety and security assurance programme and will take these into account as we develop our final recommendations.

- A.9 All subsequent references to our consultation and “Consultation Paper” or “CP” relate to our third consultation unless otherwise specified. All chapter references in this document are to the [full Consultation Paper](#) rather than the summary.

## WHO RESPONDED TO OUR PAPER

- A.10 The pie chart below shows the variety of consultees who responded to our consultation.
- (1) The four largest groups were: original equipment manufacturers (OEMs), developers of automated driving systems and fleet operators (20%), legal professionals (16%), academics (11%) and research, consultancy and professional organisations (10%).
  - (2) We also received responses from: safety and road user groups (9%), insurance providers (8%), individuals (8%), public sector organisations (7%), local representative groups (6%), disability groups (3%), and emergency services (2%).
- A.11 The technical nature of the paper was reflected in the relatively high proportion of responses received from industry representatives (20% as opposed to 15% and 16% for our first and second consultation respectively). Engagement from legal professionals and from transport research groups, consultancies and professional organisations has remained high throughout all three consultations. The proportion of individual responses rose as compared to the second consultation (from 3% to 8%), though it remained significantly below the first consultation in 2018 (17%).
- A.12 All consultees who responded to Consultation Paper 3 are listed in Annex 1.

## RESPONDENTS BY CATEGORY



## OVERARCHING THEMES

A.13 In addition to detailed responses to our 58 proposals and questions, the consultation responses revealed some broader themes which will be important foundations as we build towards our final report:

- (1) Flexibility. Many stakeholders placed a strong emphasis on the ability to revise and update regulation for AVs. The uncertainties and fast evolution of the technologies mean the legal system needs to be adaptable;

- (2) The need for clear guidance about what it takes to meet regulatory requirements, while focusing on outcomes rather than prescribing how these should be achieved, in a technology-neutral way;
- (3) The importance of a learning culture which monitors how vehicles operate in practice, and investigates and understands incidents;
- (4) A prominent role for local transport authorities within the regulatory scheme. The deployment of AVs needs to support, rather than undermine, local transport strategies;
- (5) The need to maintain harmony with international regulations, as well as fit with other policy in areas outside the scope of this review - such as connectivity, cybersecurity and infrastructure.



## B. Self-driving and human intervention

### TWO PATHS TO AUTOMATION

- B.1 Many automated driving features will rely on having a human “in the loop”. For example, they may enable a vehicle to drive itself on a motorway but require the human to take over at the motorway exit to complete the journey. The focus of automated driving technologies has been on performing the so-called “dynamic driving task”: that is, the real time monitoring of the road environment and exercise of control over how the vehicle moves. However, drivers currently fulfil many obligations that are not about dynamic driving. Instead, they relate to non-dynamic issues, such as carrying insurance or ensuring children wear seat belts. Many automated features will not themselves have the capability to perform these functions. While vehicles continue to require a human in the driving seat, it is envisaged that these duties will remain with this human.
- B.2 In the Consultation Paper we refer to technologies which require a human in the vehicle as Path 1. We labelled the person in the driving seat while the automated driving system (ADS) is engaged as a “user-in-charge”. Here we bring together the views expressed about the role of a user-in-charge and how it relates to the definition of self-driving.
- B.3 By contrast, we referred to automated vehicle technologies designed to complete trips without any element of human driving as Path 2. They may travel empty or carry only passengers or freight. In the Consultation Paper we described these vehicles as “non-user-in charge” vehicles (or NUICs). We discuss them in Section E.

### THE USER-IN-CHARGE

- B.4 When we first introduced the idea of a user-in-charge in 2018 it drew strong support. We therefore developed the concept in Chapter 12 of Consultation Paper 3.
- B.5 Again, there was strong support for the role of a “user-in-charge”. There was agreement that while an ADS is engaged, the person in the driving seat should be fit and qualified to drive but should not be seen as a “driver”. The user-in-charge would not be responsible for the dynamic driving task, although they would have other responsibilities, such as carrying insurance and reporting incidents.

### “In direct sight”

- B.6 In Chapter 12 we proposed that the user-in-charge could be someone within or in direct sight of the vehicle. People understood the concept of a user-in-charge in the vehicle but queried the idea that a user-in-charge could simply be in sight of the vehicle. This caused considerable confusion and concern.
- B.7 Many consultees pointed out that the idea of a user-in-charge in sight of the vehicle does not correspond to any current AV development. For remote control parking functions, for example, the person outside the vehicle must be within 6 metres, with

the controls in their hand. They are a driver and must monitor the environment at all times. Nor does the line of sight requirement correspond to automated valet parking, where a vehicle might be out-of-sight. For example, the Mercedes-Benz Museum in Stuttgart, Germany, uses infrastructure and connectivity to guide a vehicle to its parking space safely with no human monitoring.

- B.8 Our intention was to allow some flexibility to the concept of a user-in-charge, to allow for possible developments, yet unknown. However, in the light of the concerns expressed, we will look at this issue again. We will consider whether to specify that a user-in-charge refers to a person in the vehicle, and to regulate parking functions in other ways.

### **Qualified and fit to drive**

- B.9 There was consensus that a user-in-charge should be qualified and fit to drive, and should be subject to criminal penalties if they are not. A majority thought it should also be a criminal offence to cause or permit an unqualified or unfit person to be a user-in-charge. However, some consultees expressed concern that one could commit a criminal offence simply by accepting a lift from a drunk person who engaged the ADS. They asked that criminal liability in such circumstances should reflect comparable situations involving conventional vehicles. We will bear this in mind while developing our policy.

### **Provisional licences**

- B.10 We asked if a provisional licence holder should be allowed to be a user-in-charge. Most consultees were in favour of allowing a learner driver to engage an ADS, provided that they were accompanied by an approved driving instructor in a vehicle with dual controls.<sup>1</sup> Many responses pointed out that, in the longer term, as automated driving becomes more common, there will be a need to rethink driving instruction and driving tests: some existing skills may become unnecessary but some new skills may be needed (such as how to deal with transition demands).

### **A new offence of being carried without a user-in-charge**

- B.11 A majority of consultees agreed that it should be a criminal offence to be carried in a vehicle which requires a user-in-charge if there is no-one in the driving seat. Although there may be technical solutions to prevent this from happening, we note the industry view that legislation expressly prohibiting being carried in a vehicle without a user-in-charge will be necessary regardless of any preventive technology.
- B.12 A strict liability offence could operate unfairly in some circumstances. Consultees pointed to examples where a passenger was blind and unaware that there was no-one in the driving seat, or was a child and did not know a user-in-charge was required. We will consider the careful exploration consultees gave to possible mental elements for this offence.

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<sup>1</sup> At present, learner drivers are only allowed on motorways if they are accompanied by an approved driving instructor in a vehicle with dual controls.

## Responsibility for non-dynamic driving offences

- B.13 We provisionally proposed that while the ADS was engaged the user-in-charge would not be liable for a dynamic driving offence that involved controlling the movement of the vehicle. However, the user-in-charge would be responsible for other driving duties, such as carrying insurance and making sure children wear seat belts. We referred to these as “non-dynamic driving” duties.
- B.14 There was agreement with the principle that a user-in-charge should be responsible for non-dynamic driving offences. However, consultees told us that the distinction between dynamic and non-dynamic offences would need careful drafting, particularly for offences relating to parking, where distinctions between stopping, waiting and parking are far from clear-cut.
- B.15 Consultees raised many difficult issues about how, in practice, users-in-charge will take responsibility for vehicle roadworthiness and software updates.<sup>2</sup> Given the complexity of modern vehicles, they noted it may be impractical and unsafe to place the responsibility for roadworthiness on the user-in-charge, and unrealistic to expect them to have all the skills and knowledge to do this effectively. Others highlighted that liability should only arise if the user-in-charge was aware (or ought to have been aware) of the safety critical update for example. There is much we do not know about how often updates will be required; how safety-critical they might be; or how easy they will be to install over-the-air. In the consultation we proposed a regulation-making power to adapt these offences. Consultees overwhelmingly agreed. The legislation will need to be kept sufficiently flexible to adapt to changing circumstances.

## Criminal liability following handover

- B.16 Consultees agreed that a driver who takes over from an ADS should have a defence to a criminal charge where the problem was caused by the ADS. Many argued, however, that the test for the defence set out in the Consultation Paper (that “a competent and careful driver could not have avoided the offence”) was overly difficult to satisfy. We will give careful consideration to the suggestions made to fine-tune this test (by, for example, adding an element of reasonableness).

## TRANSITION DEMANDS

- B.17 In Chapter 4 we provisionally proposed that a vehicle should not be considered self-driving if it required a human to monitor the driving environment, the vehicle or the way it drives. The user-in-charge should only be required to intervene in response to a clear and timely transition demand,<sup>3</sup> and not in response to any other event.
- B.18 The majority of consultees agreed with our approach. However, a significant minority expressed concern about treating a vehicle as self-driving unless it can come to a safe stop following a failed transition demand. Under UNECE Regulation 157 on

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<sup>2</sup> CP3, Consultation Question 35(2).

<sup>3</sup> A transition demand is an alert issued by an ADS to a person to take over the dynamic driving task from the ADS, communicated through visual, audio and haptic signals, which gives the person a transition period within which to respond. Absent a response, the ADS performs a risk mitigation manoeuvre bringing it to a stop.

Automated Lane Keeping Systems (ALKS), the system will come to a slow stop in lane with its hazard warning lights on.<sup>4</sup> A range of stakeholders argued that vehicles classified as self-driving should do more than this, and should find their way to a refuge or motorway service station.

- B.19 This was linked to the length of time users-in-charge need to regain situational awareness following a transition demand before they can safely resume driving. The UN Regulation on Automated Lane Keeping Systems requires a minimum of 10 seconds, but many consultees expressed concern that this may not be sufficient. In April 2021, the Department for Transport published a review which cited literature suggesting that 10 seconds is an adequate time budget.<sup>5</sup> However, there is no single, accepted takeover time. Instead:

*Takeover is impacted by specific situational variables (e.g. traffic complexity, takeover demand warning, human-machine interface design, secondary task type) and individual variables (e.g. age, experience and skill).... The result is that a range of takeover times is reported in the literature.*

- B.20 We do not think that it is possible for us to set hard and fast rules for what must happen after a failed transition demand. As the current debate over smart motorways shows, there is little agreement on what a safe end-state looks like. Even an extremely capable system may be unable to find a completely safe place to stop, given constraints in its physical environment. Therefore we have not based our definition of self-driving on the exact details of what happens after a failed transition demand. Nor are we well placed to decide how long a transition demand should be.
- B.21 On the other hand, we note the many concerns about transition demands expressed to us. As consultees stressed, self-driving vehicles must be safe - which means that following a transition demand they must give the user-in-charge sufficient time to take back control, and not present a crash hazard to other vehicles. Transition demands raise significant safety concerns which need to be given due weight in the overall approval process and decision whether an AV can safely drive itself.

### **Transition demands for all users**

- B.22 In the Consultation Paper we said that transition demands should be designed for all users who can currently hold a driving licence, including those who are deaf or hearing impaired. Transition demands should therefore use haptic signals (related to the sense of touch, such as shaking the seat) alongside visual and audio signals.
- B.23 Consultees were overwhelmingly in favour of designing self-driving features inclusively, highlighting the needs of other user groups, such as those with arthritis or dexterity issues. Respondents said we should also consider transition demands for

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<sup>4</sup> UN Regulation 157 on uniform provisions concerning the approval of vehicles with regards to Automated Lane Keeping Systems ECE/TRANS/WP.29/2020/81 (25 June 2020) (ALKS Regulation), para 5.5.1.

<sup>5</sup> N Kinnear and others, "Safe performance of other activities in conditionally automated vehicles", TRL, published as Annex A to Department for Transport, *Safe Use of Automated Lane Keeping System (ALKS): Summary of Responses and Next Steps* (April 2021), <https://www.gov.uk/government/consultations/safe-use-of-automated-lane-keeping-system-on-gb-motorways-call-for-evidence>.

those who have steering wheel adaptations or who can only drive using manual controls or while seated in their own wheelchairs. A common theme was that AVs have the potential to bring significant benefits to people with disabilities and should be designed with this in mind.

## C. Assuring safety pre-deployment

### HOW SAFE IS SAFE ENOUGH?

- C.1 In Chapter 5 we asked about the appropriate safety thresholds for automated vehicles; the appropriate comparisons; and who should decide these and how.

#### The safety decision

- C.2 We provisionally proposed that the Secretary of State should decide whether a vehicle is sufficiently safe to “safely drive itself”, as informed by a specialist regulator. This proposal was made against the backdrop of the detailed safety assurance scheme set out in Chapter 8. Our proposal was largely supported. The scope of the Secretary of State’s discretion to depart from the specialist regulator’s advice requires further thought, with many responses highlighting the importance of predictability and consistency.

#### The safety standard

- C.3 We also asked which of three standards is the most appropriate in assessing the safety of automated vehicles: (a) as safe as a competent and careful human driver; (b) as safe as a human driver who does not cause a fault accident; or (c) overall, safer than the average human driver. No one standard received a clear majority of support.
- C.4 Many consultees noted that the standard would have to be high to achieve public acceptance. Some challenged the feasibility of comparing the performance of AVs with humans, noting that AVs would make different kinds of mistakes.
- C.5 We received some suggestions about how the standards could be quantified, for example by measuring the “mean time between failures” of an average driver and setting a goal for AVs to improve on that. Some respondents suggested alternative standards for safety, such as basing the comparison on the performance of a competent and careful driver in a vehicle fitted with the most advanced driver assistance available. There was also an expectation that the safety of AVs should improve over time and a desire for this to be built into the standard-setting process. We will explore these issues further, with particular attention to emerging standards-development, both internationally and in the UK.
- C.6 We also sought views on how AVs can be made as safe as reasonably practicable. Common themes included rigorous testing, a robust safety approval scheme and further standard setting, especially for areas such as risk management and software updates. Many referred to the need for the entity behind the ADS (the ADSE) to submit a detailed safety case. Another common suggestion was driver education, through mandatory training for drivers, or obliging ADSEs to disseminate certain information to users. Others highlighted the role of road infrastructure in helping to guarantee safety. Our focus will be on creating appropriate powers and obligations for the regulator to give effect to these suggestions.

## Public sector equality duty

- C.7 The Equality Act 2010 requires public authorities to have due regard to eliminating discrimination and advancing equality of opportunity for persons with protected characteristics (such as race, sex, age and disability) in exercising their functions. We asked for views as to how regulators of AVs, as public authorities, can meet this public sector equality duty. Common answers included requiring appropriate consideration of protected groups and vulnerable road users in safety cases and encouraging ADSEs to incorporate bias elimination into development and testing. We will consider what powers the regulator will need to implement these suggestions.
- C.8 We note suggestions that regulators could consult an advisory committee representing diverse communities and including end-users to enable a wide range of experiences to be taken into account.<sup>6</sup> We will also consider whether it would be appropriate to oblige the regulator to work with particular bodies or individuals. Some consultees cited the example of the Office for Rail and Road and the Civil Aviation Authority, which require operators to have policies on accessible travel and disabled people's protection. We will take this into consideration.
- C.9 We understand that the Government is looking at issues of discriminatory behaviour by AVs as part of the CAVPASS programme. A joint project between CCAV and the Centre for Data Ethics & Innovation will also be considering how to embed ethical due diligence into the proposed regulatory framework.

## METHODS OF ASSESSING SAFETY

- C.10 In Chapter 7 we focussed on the practicalities of assessing AV safety, drawing on a growing literature on the challenges of setting standards and developing tests. We noted the importance of safety cases in other high-risk industries, such as the rail, aviation and nuclear sectors. We provisionally proposed a mixed approach. Initially, the ADSE's safety case would be central to safety assurance. Regulators should provide guidance for what should be in the safety case and should then audit the safety case. In addition, regulators should carry out some independent tests to validate the safety of an AV.
- C.11 Consultees expressed broad agreement, emphasising the need for a flexible approach which can change over time. The legislation must allow the regulator to provide clear guidance on what should be in the safety case and for the overall safety standard the vehicle must meet. Initially, the safety case will be central: the regulator will need to audit this carefully and have powers to require independent tests. We wish to focus on outcomes rather than processes, so as not to disadvantage unconventional methodologies which can achieve similar or better safety outcomes.
- C.12 There was also broad agreement that where approval authorities intend to use a scenario database as part of testing, they should consult on the scenarios used, to ensure outside involvement in the process. Consultees made strong arguments for why road user groups, academics, insurers, the police and highways authorities have something to contribute to this process. However, consultees also thought that

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<sup>6</sup> CP3, Consultation Question 6.

regulators should remain responsible for the content of tests. We agree that consultation should be only one part of the process. The development of scenarios will need to rely on systematic real-world data and developers' technical expertise. Furthermore, the regulator should make the final decisions on what is in the test database, with responsibility to ensure that the range of scenarios is relevant, balanced and realistic.<sup>7</sup> We understand that scenarios are being considered as part of the CAVPASS programme.

## INITIAL APPROVALS AND CATEGORISATION

- C.13 Chapter 8 set out a scheme to assess the safety of AVs before they are allowed on the road. At present, vehicle approval is dealt with by a separate legal framework from that which governs driver behaviour and liability. Vehicle approval is a largely international process: the UK is bound both by the Revised 1958 UNECE Agreement on Wheeled Vehicles, Equipment and Parts, and by a series of trade agreements with (for example) Japan, the Republic of Korea and the European Union.<sup>8</sup> By contrast, driving behaviour and liability are largely matters of domestic law.<sup>9</sup> This is illustrated by the fact that out of 56 UNECE countries, 46 drive on the right while 10 drive on the left.
- C.14 AV regulation involves making decisions about both vehicle technical requirements and driver responsibilities. It must therefore fit with both legal frameworks. Our proposals are designed to be fully compatible with the UK's international obligations, while also allowing domestic decisions to take account of Great Britain's high level of road safety, driver laws and unique road environment.
- C.15 In Chapter 8 we proposed a two-stage process before AVs were authorised for GB roads. At Stage 1, manufacturers would have a choice. To place an ADS onto the market:
- (1) a manufacturer could apply for type approval at international (UNECE) level; or
  - (2) a manufacturer or developer could apply under a national ADS approval scheme for GB-only approval.
- C.16 However, the fact the ADS meets technical specifications at Stage 1 would not itself decide whether the ADS-equipped vehicle can be lawfully used on GB roads without monitoring. Before a human user could take their eyes off the road and be free from liability for the dynamic driving task, a second authorisation stage would be needed. This stage would identify the relevant ADSE who would vouch for the safe and responsible deployment of the automated vehicle throughout its lifecycle. The ADSE would submit the whole vehicle to the UK regulator. The regulator would ask if the vehicle as a whole was able to meet the Government's safety standards, without being controlled or monitored by a human driver.

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<sup>7</sup> CP3, Consultation Question 8.

<sup>8</sup> The regulation of vehicle standards is described in detail in CP3, Ch 6.

<sup>9</sup> Subject to the Vienna Convention on Road Traffic 1969, discussed in CP1, paras 2.48 to 2.54.



C.17 Chapter 8 asked questions about the details of this process. We are encouraged by the support shown for a robust safety assurance process before AVs are deployed on GB roads. We intend to refine our proposals for the two stages of the process, before making recommendations for primary legislation. The legislation will need to give sufficient certainty where this is needed, while retaining considerable flexibility to deal with the many unknowns in this fast-developing area.

### **Prohibiting unauthorised ADSs**

C.18 Responses revealed a strong desire to prohibit unauthorised ADSs. We will need to give further thought to the definition of an ADS for these purposes. An ADS is normally defined in terms of hardware and software “that are collectively capable” of performing the entire dynamic driving task on a sustained basis. However, we most wish to prohibit systems that are *not* “capable” of safely performing the dynamic driving task but which give the impression of being self-driving. The difference between a “bad” ADS and a system which is not an ADS is far from clear. We therefore think that the prohibition should be aimed at unauthorised systems which purport (through marketing for example) to be self-driving or which give users the (false) impression that the user does not have to monitor the driving environment.

C.19 We provisionally proposed that the prohibition on unauthorised ADSs should be subject to an exemption procedure for trials.<sup>10</sup> Several consultees considered this unnecessarily bureaucratic. We note the support for the current Code of Practice on trialling and do not wish to add administrative burdens to the process. Where the vehicle is being monitored at all times by a safety driver (whether in or outside the vehicle), we would not wish to bring the system within our definition of purporting to be an ADS. We will further consider how legislation can ban systems which purport to be self-driving, while ensuring we do not create onerous obstacles to trialling.

### **Integrating the ADS with the vehicle**

C.20 There was general support for the idea that a manufacturer should have a choice between international or domestic ADS approval at Stage 1 of the process. Under the traditional UNECE approach, approval is given to a component or a system rather than to a whole vehicle. However, many consultees expressed concern that a developer might submit a system which was not fully embodied in a vehicle. Consultees highlighted that in practice the performance of the ADS cannot be separated from the whole vehicle. For example, the ADS outputs, given certain pre-defined inputs, cannot be contextualised without evaluating the vehicle performance, and may vary depending on the brand of vehicle.

C.21 We will consider the full implications of this in formulating our final recommendations. For trials, it is common for an ADS to be installed into a pre-registered vehicle. For deployment, however, the GB whole vehicle type approval process will need to give particularly close scrutiny to whether an ADS has been appropriately integrated into the vehicle in which it is installed. Where the ADS is installed into a pre-registered

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<sup>10</sup> CP3, Consultation Question 9.

vehicle that already has type approval, a possibility is that the vehicle should return for approval under a multi-stage procedure.

### **The role of the Automated Driving System Entity (ADSE)**

- C.22 There was widespread agreement that a safety regulator should only recommend classification as self-driving if it is satisfied that a suitable ADSE is able to take responsibility for the way the vehicle drives. The ADSE would need to be able to show it was closely involved in assessing safety and that it had sufficient funds to respond to improvement notes, pay fines and organise a recall.<sup>11</sup> Several consultees expressed concern that smaller market participants should not be excluded from the market by onerous capital requirements if they could obtain insurance to cover the risk.
- C.23 We accept that ADSEs should be able to demonstrate sufficient funds through a variety of methods, including insurance. The legislation will need to be flexible, setting out the broad principles, with other issues left to regulation and guidance.

### **Categorisation outcomes**

- C.24 In Chapter 8, we provisionally proposed that the categorisation decision should have one of three outcomes: not self-driving but driver assistance; self-driving only with a user-in-charge, or self-driving without a user-in-charge.
- C.25 Consultees preferred avoiding the label of “driver assistance” for vehicles that failed to pass the second stage test. Many noted that a system designed to operate without monitoring or control by a human might not be safe if used as a driver assistance system. Instead the end result for the second stage should simply be “self-driving” or “not self-driving”.
- C.26 Consultees also thought that these outcomes might be overly rigid. In some cases, a vehicle might combine some features that can be used only with a user-in-charge (such as motorway pilots) with others that can be used without a user-in-charge (such as valet parking). Different ADS features might be engaged at different times. This suggests that the decision (that the vehicle is self-driving rather than not self-driving) will need to specify particular ADS features. For each feature, the decision will need to define the operational design domain and state whether a user-in-charge is required. Some stakeholders highlighted that definitions of the operational design domain should include weather conditions, as the weather may have a crucial effect on safety.

### **Limited deployment**

- C.27 We asked whether the regulator that classifies vehicles as self-driving should have power to allow their deployment in limited numbers, so as to gather further data on their safety in real world conditions. This received a mixed response. While some saw merit in the suggestion, others felt that unsafe vehicles would be deployed on public roads or (alternatively) that extra burdens would be put on manufacturers.

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<sup>11</sup> CP3, Consultation Question 23.

C.28 Stakeholders also highlighted non-safety-related reasons why numbers might usefully be limited, such as avoiding congestion and enabling local transport authorities to exercise their traffic management obligations. We will give the issue further consideration.

### **Appeals**

C.29 Respondents told us appeals have been seldom used in the area of vehicle approvals. While most consultees thought that an appeal process was necessary, others suggested that manufacturers should simply “go back to the drawing board” and submit again. Our current view is that an appeal process would be useful even if it is only rarely used. It could, for example, avoid the need for expensive judicial review.

## D. Safety in use

### IN-USE SAFETY ASSURANCE

- D.1 In Chapter 10, we proposed a scheme for ensuring that AVs remain safe once they are in use on the roads. Respondents unanimously supported the creation of an in-use safety assurance scheme, which was seen as an essential part of the new regulatory landscape for AVs.
- D.2 Stakeholders asked for clarification about the scope of issues to be regulated through in-use monitoring. For example, they were uncertain about whether the scheme would be limited to safety considerations, or whether it would consider all traffic infractions. They also asked about the relationship with existing regulators who may have an interest in AVs, such as the Information Commissioner or transport licensing authorities. Drawing these boundaries will require careful consideration.
- D.3 There are also questions about what should happen if an AV is found to be less safe than was anticipated at the time when it was authorised. Some argued that the in-use safety regulator should not have power to withdraw authorisation for a vehicle unless there was a significant safety concern.

### Powers of the in-use scheme

- D.4 Respondents widely supported the collection of data on AV performance for in-use monitoring.<sup>12</sup> This extended to both leading measures (instances of bad driving which could have led to harm) and lagging measures (outcomes which led to actual harm). Many emphasised the importance of choosing appropriate measures, which would not necessarily mirror some of the classic leading measures used to indicate “bad driving” in humans. Instead new measures would be needed, like the frequency of emergency manoeuvres or unstable lateral positioning within lane. We understand that Government is considering these issues as part of the CAVPASS programme.
- D.5 There was full agreement that there should be power to order a software update where this is needed for safety and compliance with the law. Some respondents suggested that the party ordered to make the change should have the option, where appropriate, of doing so by way of a hardware upgrade, and they emphasised the importance of regulating with a focus on outcomes, rather than the means by which these would be achieved.
- D.6 There was strong support for the proposal that communication and training about an ADS should be clear and effective and that the regulator should have power to enforce this. Some consultees thought that communication from the ADSE should be supplemented by public awareness campaigns.

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<sup>12</sup> CP3, Consultation Question 18(2).

- D.7 Under UNECE regulations, software updates which could affect a type approved system will likely require a manufacturer to return to the original approval authority to gain approval for the update. This original approval authority may well be in another jurisdiction. However, some software updates may only be required in Great Britain, to deal for example with changes to road rules or traffic conditions. Respondents generally supported the suggestion that software updates that only apply in Great Britain could be submitted for approval to the domestic AV safety regulator instead of returning to the original foreign type approval authority. Some said the obligation to return to the original approver should remain if the software update would have a material effect on the driving task.
- D.8 Cybersecurity for AVs lies outside our terms of reference, with cybersecurity policy led by government. However, stakeholders throughout our review have highlighted its central importance to safety. We therefore asked if the in-use monitoring scheme should also deal with cybersecurity. There was near unanimous agreement that it should. Several consultees commended the cybersecurity scheme set out in UN Regulation 155,<sup>13</sup> suggesting that the UK should adopt the scheme rather than duplicating it.

## **Governance**

- D.9 We asked whether the regulation of in-use safety should be within the remit of the body responsible for type approval or whether the two bodies should be separate. Views were finely balanced. We also asked for views on mechanisms to ensure the regulator administering the safety assurance scheme would remain open to external views. The more favoured suggestions were an advisory committee, and/or a duty to consult, but there was little consensus on how this should be implemented.

## **INVESTIGATING TRAFFIC INFRACTIONS AND COLLISIONS**

- D.10 In Chapter 11 we considered two challenges. The first was how to deal with breaches of traffic rules. The second was how to learn from collisions so as to promote a safety culture.
- D.11 In both cases we proposed a move away from the current emphasis on the criminal prosecution of human drivers. Instead, we proposed that the in-use safety assurance scheme should investigate breaches of traffic rules by AVs driving themselves and apply a flexible range of regulatory sanctions on ADSEs. There was broad agreement on all the policies we put forward in this chapter.

## **Collision investigation**

- D.12 We highlighted the need to learn from road incidents in a way that promotes a culture of safety. We therefore proposed a small specialist investigation unit to analyse data on incidents involving AVs. It would also investigate the most serious, complex or high-profile collisions and make recommendations to improve safety without allocating blame. This proposal was broadly supported, though consultees asked about how the new body would interact with the police (both in immediately securing the scene, and

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<sup>13</sup> UN Regulation 155 on uniform provisions concerning the approval of vehicles with regards to cyber security and cyber security management system ECE/TRANS/WP.29/2020/79 (22 January 2021).

in later investigations). This is particularly relevant as a mixed environment of automated and conventional vehicles is likely to prevail for some time.

### **Adapting road rules**

- D.13 In Chapter 11 we noted the difficulties with producing a “digital highway code”. We highlighted that AVs will need to abide by current road rules but noted that blind obedience to rules can cause problems.
- D.14 We did not think it appropriate for the Government to attempt to turn the current highway code into algorithms that can be used by ADSs. After analysing the responses to our first consultation, we concluded that a digital highway code that sets precise values for every instance is not possible. Expecting regulators to anticipate all possible scenarios in advance would place an impossible burden on them.
- D.15 However, we did think it possible to provide for a more structured dialogue between developers and regulators. To this end we proposed a forum for collaboration on the application of road rules to self-driving vehicles. An overwhelming majority of respondents supported the proposal. Many highlighted that the forum should engage with diverse user groups (including those with disabilities) and contribute to ongoing efforts at an international level to develop safety models for AV behaviours. Examples of issues for the forum to consider included circumstances where departure from road rules is allowed (to avoid collisions for example) and specifying values for reasonable worst case assumptions about scenarios. Others highlighted the need to embed an overall concept of reasonable, safe, and predictable driving. Although four respondents had queries about how it would function, no one disagreed. We understand that the CAVPASS programme is considering how automated vehicles can demonstrate compliance with road rules.

## E. Remote operation - no user-in-charge vehicles

- E.1 In Chapter 13, we considered “Path 2” vehicles that do not need a human in the vehicle to drive at any stage to complete a trip. We referred to these as “no user-in-charge” vehicles or NUICs. We acknowledged that such vehicles would rely on some form of remote operation and considered the challenges this poses.

### DISTINGUISHING REMOTE DRIVING FROM SELF-DRIVING

- E.2 In the Consultation Paper, we considered how to apply the “control and monitoring” tests to remote operation. We concluded that “remote driving”, where an individual is steering and braking a vehicle remotely, should not be regarded as a form of “self-driving”. This attracted overwhelming support from respondents.
- E.3 Views were more mixed on our provisional proposal that all other types of remote operation (apart from remote steering and braking) should be regarded as “self-driving”. Some respondents thought it was counter-intuitive that under our proposals, human monitoring from within a vehicle takes it outside of the “self-driving” definition, but human monitoring from outside the vehicle would not.
- E.4 Several developers drew a distinction between real-time monitoring (with emergency intervention) and “remote assistance”. With remote assistance, the ADS may, for example, require help before proceeding in the face of unexpected objects or with manoeuvres it identifies as potentially inappropriate. In these cases, a remote assistant helps the ADS to decide what to do. It was said that a system which requires emergency human intervention in the course of the dynamic driving function should be regulated separately as remote driving. On the other hand an ADS that relies on remote assistance, while itself conducting all elements of the dynamic driving task, should be considered self-driving.
- E.5 Although remote driving is outside our terms of reference, it would appear to require further regulation. The UK is leading efforts in the UNECE’s Working Party 1 to develop principles enabling safe remote driving, and industry stakeholders emphasised the importance of international alignment in this area. Others pointed to the safety risks of requiring a person in a remote centre to intervene in an emergency, without necessarily having the same situational awareness of a driver in the vehicle. We would encourage the UK Government to take account of all forms of remote driving (relating to steering, braking and monitoring), and consider whether this can be carried out safely on GB roads. We understand that CCAV has begun to explore the likely demand for remote driving and the benefits and risks within its CAVPASS programme, before deciding if regulatory changes are appropriate.

### LICENSED OPERATORS

- E.6 There was widespread support for our proposal that all NUIC vehicles should be operated by a licensed operator (or covered by a contract with a licensed operator). Respondents thought this was simpler than our previous proposals (which

distinguished between privately-owned vehicles and those providing a passenger service). It would also ensure that complex supervision and maintenance tasks are conducted by people with sufficient expertise.

- E.7 Concerns were expressed about the division of responsibilities between ADSE and operator, with suggestions that this should be set out in contractual arrangements between the ADSE and the operator. Consultees supported the idea that, at least initially, a licensed operator should submit a safety case as part of its application to be licensed, which might allow for flexible arrangements of this type.

## **TIER 1 AND TIER 2 OPERATOR DUTIES**

- E.8 We proposed that licensed operators should be subject to two tiers of duties. While Tier 1 duties would apply to all vehicles, Tier 2 duties would depend on the use case (those designed to carry passengers will need to comply with different rules from those applying to a goods vehicle or snow plough).
- E.9 There was considerable agreement that licensed operators should be subject to “Tier 1” duties to supervise, maintain and insure vehicles, install updates and report incidents. We accept the need for clear definitions here, particularly for “supervision” and reporting “untoward events” (which will require context sensitive definition).
- E.10 Many consultees pointed to future uncertainties in this area. Consultees asked for some flexibility to adjust or transfer these duties as the market develops, without the need for further primary legislation. Local transport authorities argued strongly that “Tier 2” requirements should allow for local decision making in response to local needs. We will consider how this can best be done.

## **ACCESSIBILITY**

- E.11 Respondents agreed on the importance of ensuring that vehicles without a user-in-charge are accessible to all, including disabled and older people. We are grateful for respondents’ suggestions on how accessibility standards should be developed, including references to existing best practice and input on the novel challenges posed by driving automation. There was a very high level of support for the proposal on the formation of an accessibility advisory panel, and we will develop this further in the final report.

## **ADMINISTERING THE SCHEME**

- E.12 The Traffic Commissioners were the body most frequently suggested to administer the scheme. One advantage of the Traffic Commissioners is their well-developed, accepted system for providing detailed guidance on operator duties. We will consider how this guidance could be used to provide the clarity and flexibility consultees asked for.



## F. New criminal offences

### CRIMINAL OFFENCES BY THE ADSE AND ITS SENIOR MANAGERS

- F.1 In response to our first consultation, the great majority of consultees thought we should review possible criminal offences where wrongs by an ADSE result in death or serious injury.
- F.2 The results of our review were set out in Chapter 14 of Consultation Paper 3. We thought it would be wrong to blame or prosecute an ADSE simply because a human driver would be blamed in similar circumstances. Instead we wished to support the safety assurance scheme by deterring serious wrongdoing that undermined this process.
- F.3 We provisionally proposed that it should be an offence for an ADSE to omit safety relevant information or include misleading information when putting a vehicle forward as self-driving or responding to requests from the regulator. The offence would be committed by the ADSE as a corporate body, subject to a due diligence defence. An offence would also be committed by senior managers, where the conduct took place with their consent or connivance or was attributable to their neglect. Where the wrongdoing was associated with a death or serious injury, the offence would be aggravated and higher penalties would apply. We asked if consultees agreed with this policy. We then set out drafts of four offences and asked for views.
- F.4 Two thirds of consultees agreed with our provisional proposals, describing them as essential to protect safety, create accountability and ensure public trust. However, there were some areas of controversy:
- (1) Some consultees thought that “safety-relevant information” required more specific definition.
  - (2) Several consultees raised issues about the definition of “senior managers”. Although this concept is currently used on the statute book,<sup>14</sup> it may not correspond with the practical reality of safety responsibility. Some thought that the ADSE should designate a single responsible senior manager. Others thought more junior employees should also be guilty of an offence, especially if the employee knew that information was misleading.
  - (3) Several industry members argued that, rather than requiring the defendant or accused to show due diligence, the prosecutor should prove knowledge or intent.
  - (4) A few consultees pointed to difficulties in defining when the non-disclosure or misrepresentation “caused” the death or serious injury. This led some

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<sup>14</sup> See Insurance Act 2015, s 4(8)(c) and Corporate Manslaughter and Corporate Homicide Act 2007, s 1(4)(c).

consultees to take a different approach, by (for example) taking the result into account in sentencing.

- F.5 We are encouraged by the strong support for criminal offences to deter misrepresentation and non-disclosures to the safety regulator. We will look carefully at the specific issues raised before finalising our recommendations.

## **NEW WRONGFUL INTERFERENCE OFFENCES**

- F.6 There are many ways in which people could interfere with AVs. Stakeholders have expressed concerns about a wide range of actions, from hacking to damaging sensors or “spoofing” road signs.<sup>15</sup> In Consultation Paper 1 we reviewed the law in this area, and concluded that almost all of these actions were already criminal. However, we proposed three amendments. We developed our proposals further in Consultation Paper 3, as discussed below.

### **Tampering**

- F.7 Under section 25 of the Road Traffic Act it is an offence for a person to “tamper” with a vehicle’s brakes “or other part of its mechanism”. In Chapter 15, we provisionally proposed a legislative amendment to clarify that this includes anything that is physically part of a vehicle or any software installed in it.<sup>16</sup> People overwhelmingly agreed. Some respondents also suggested a range of penalties depending on the seriousness of the potential consequences of any tampering.

### **Causing death or serious injury by wrongful interference**

- F.8 In England and Wales, it is an offence under section 22A of the Road Traffic Act 1988 to wrongfully interfere with a motor vehicle or traffic equipment, where “it would be obvious to a reasonable person that to do so would be dangerous”.
- F.9 We provisionally proposed that the offence should also apply in Scotland. We also thought that there should be a new aggravated offence, where interfering with an automated vehicle contrary to section 22A caused death or serious injury. There was near unanimous support for an aggravated offence of this sort.
- F.10 Most respondents thought the offence should apply across the whole of Great Britain. On the other hand, a case was also made for not changing the law in Scotland. It was said that such behaviour is already covered by common law and that it was important to maintain the coherence of Scots common law.
- F.11 There was general consensus that “approved work” for repair and maintenance authorised by a vehicle manufacturer or ADSE is desirable and should not be covered by the proposed offences. However there was some disagreement on whether a

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<sup>15</sup> “Spoofing” refers to fooling the vehicle’s systems to achieve a desired reaction. In the context of road signs this could occur either by making changes to an existing sign so that it cannot be recognised by AV sensors (such as by adding stickers), or by projecting a (false) road sign onto digital billboards or onto the road.

<sup>16</sup> CP3, Consultation Question 47.

defence was necessary. We will carefully consider these observations as we develop our final recommendations.

## **G. Civil liability**

G.1 In Consultation Paper 1 we reviewed the Automated and Electric Vehicles Act 2018, which introduced reforms to smooth the path to compensation for those injured by self-driving vehicles. We received many comments on the 2018 Act, which we reviewed in Consultation Paper 3. Our broad conclusion was that the 2018 Act was “good enough for now”. We asked if consultees agreed.

### **CONTRIBUTORY NEGLIGENCE AND CAUSATION**

G.2 In Consultation Paper 3 we analysed the many detailed comments made about how the 2018 Act dealt with contributory negligence and causation. We asked consultees if they agreed with our conclusion that the law in this area was adequate at this stage, but should be reviewed in the light of practical experience.

G.3 Most respondents agreed with our assessment. Some stakeholders called for guidance to help illustrate the application of the legislative framework to a range of different potential incidents. It was said that any lack of legal clarity would work in favour of insurers rather than victims due to the considerable “inequality of arms” between the parties. We will consider these suggestions as we move towards the final report.

### **UNINSURED VEHICLES**

G.4 We noted that, at present, the 2018 Act could leave victims of collisions involving uninsured AVs without any route to compensation. For conventional vehicles, the issue is dealt with by agreements between the Secretary of State for Transport and the Motor Insurers’ Bureau (MIB) (which is the insurer of last resort). These only apply where there is a claim against an untraced or uninsured person. However, this will not be the case when a vehicle is driving itself because, under section 2(1) of the 2018 Act, liability does not arise at all where the vehicle is uninsured.

G.5 Our proposal that measures should be put in place to close this gap in compensation received unanimous support from respondents. We understand that discussions between the UK Government and the MIB on this issue are ongoing and hope that the matter will be resolved soon.

### **SECONDARY CLAIMS UNDER THE CONSUMER PROTECTION ACT 1987**

G.6 Under the 2018 Act, the insurer is directly liable to the victim, but may bring a secondary claim against anyone else liable for the incident. One possibility is that the insurer might bring a claim against the producer under the Consumer Protection Act 1987.

G.7 One difficult question is how far the 1987 Act applies to over-the-air software updates, provided without a physical medium. We thought this issue should be reviewed, but generally, not simply for AVs.

- G.8 Most consultees agreed. They pointed out that issues of product liability and software are not unique to AVs and wished to maintain consistency and alignment in the development of product liability law for emerging technologies. However, a significant minority of stakeholders saw merit in an automated vehicle-specific review which could be undertaken quickly, before AVs are deployed onto the roads.
- G.9 We continue to think product liability law should be reviewed generally, and not simply for AVs. Reforming product liability law raises difficult issues, especially as it is uncertain what approach the UK Government will take to the EU project to review the Product Liability Directive on which the 1987 Act is based. It could be a suitable topic for a Law Commission review.

## H. Access to data

H.1 Most data protection issues are outside the scope of our project. However, some are integral to our proposals. Chapter 17 considered the data needed for our proposed legislative scheme to work. We looked particularly at the data that would need to be collected, stored and shared to investigate collisions and traffic infractions and to decide insurance claims.

### CURRENT INITIATIVES ON DATA RECORDING

H.2 In Chapter 17 we summarised initiatives at both EU and UNECE level to introduce “event data recorders”, to record key data following a collision. However, under EU law, this data must be anonymous. It is intended to allow authorities to analyse patterns of problems - not to investigate any individual collision, or to determine criminal or civil liability.

H.3 AVs will have a second system of data capture, known as a Data Storage System for Automated Driving (or DSSAD). Under the ALKS Regulation, the DSSAD must record each time an ALKS is activated or deactivated or issues a transition demand (together with a date and time stamp). It also records when the vehicle is involved in a detected collision, but no parameters have yet been set. There is a risk that the system may miss “soft” collisions, for example with motor cyclists.

H.4 The ALKS Regulation leaves issues of access to data, privacy and data protection to national laws. The system must be capable of including 2,500 time stamps, equivalent to around 6 months of use. However, contracting states can require that the data are stored for longer.

### LOCATION DATA

H.5 Our understanding is that it would be technically feasible for the DSSAD to record GPS co-ordinates as well as a time stamp, but this requirement was omitted from the UN Regulation due to privacy concerns. We provisionally proposed that the DSSAD should record location, so as to establish whether an ADS was engaged during an incident if the location was known, but witnesses were uncertain about the exact time.

H.6 We received strong support from consultees, who thought that location data was necessary to establish liability and monitor safety. Consultees saw a need to balance these aims with privacy concerns and suggested possible safeguards.

### DUTY TO SHARE DATA WITH INSURERS

H.7 We provisionally proposed that those controlling AV data should be under a legal duty to disclose data to insurers, where this is necessary to decide claims fairly and accurately. We received strong support, particularly from insurers. However, insurers and manufacturers expressed divergent views. While insurers wanted clear and

enforceable duties to provide a range of data within set time limits, industry representatives wanted to restrict data to that which is strictly necessary.

- H.8 Our current view is that legislation should set out a general duty along the lines we proposed. The details would be left to industry agreement, codes of practice or statutory instrument. We note the approach taken by the Digital Economy Act 2017, which sets out broad powers to share data. The relevant Minister is then obliged to issue a code of practice, to which all those sharing data must have regard.<sup>17</sup> We will explore the possibility of similar codes of practice or guidance in this context.

## STORING DSSAD DATA

- H.9 We provisionally proposed that DSSAD data should be retained for a period of three years, to reflect the standard limitation period for bringing legal claims. Half of consultees agreed, on the basis that three years struck the right balance between the rights of claimants and the burden of long-term mass data storage. Other consultees were split between those who thought three years was too long and those who thought it was too short.
- H.10 Consultees who felt the period should be shorter focused on the cost and practical difficulties of data storage, referring us to standards in Germany and international instruments (which indicate 6 months). Consultees who thought the period should be longer were against undermining the policy underlying longer limitation periods, for example where the claimant is a minor. There was little agreement as to how long any additional period should be, with consultees arguing for many different periods between four years and 21 years.
- H.11 We remain of the view that storage must be long enough to cover the great majority of claims. However, we note the controversy surrounding the time period and will discuss the costs further with those in the industry.

## SAFEGUARDS

- H.12 We provisionally proposed that ADSEs should present regulators with details of how data will be recorded, stored, accessed and protected. The regulator should only authorise a system for use as self-driving if these systems comply with data protection law. Consultees were resoundingly in favour of this proposal.
- H.13 As many consultees pointed out, there is still work to be done in understanding how data protection law applies to the many forms of data AVs collect. This will include, for example, working out when data is personal or special category data, how users will be given privacy information and how data will be anonymised where necessary. These issues were excluded from our terms of reference, but we are happy to share our materials with those who take them on. We understand that the CAVPASS programme is developing requirements for what data need be recorded.

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<sup>17</sup> Digital Economy Act 2017, s 43.

## **NEXT STEPS**

H.14 We plan to publish our final report at the end of this year. Our report will include recommendations for legal change, in the hope that new legislation will be enacted soon, to establish a legal framework for AVs in Great Britain.



## Annex 1: Respondents

Amey  
Anxiety UK  
Apollo Group  
Association of British Insurers (ABI) and Thatcham Research (joint response)  
Association of Local Bus Managers (ALBUM)  
Association of Personal Injury Lawyers (APIL)  
Assuring Autonomy International Programme, University of York (AAIP)  
Atkinson, George Kenneth (personal response, associated with the Livia Memorial Fund)  
Aviva Insurance  
AXA UK  
Bar Council  
Bates, Paul  
Birch, Richard  
BlackBerry Corporation  
BLM LLP  
British Insurance Brokers' Association (BIBA)  
British Insurance Law Association (BILA)  
British Motorcyclists Federation  
British Parking Association (BPA)  
British Vehicle Rental and Leasing Association (BVRLA)  
Broadbent, Craig  
Burgess Salmon LLP  
Carter, Henry  
Chartered Institute of Highways and Transportation (CIHT)  
Connected Places Catapult - CertiCAV  
Cox, Andrew (personal response, associated with Lincolnshire Police and National Collision Investigation Board)  
Cycling Scotland  
Cycling UK  
DAC Beachcroft LLP  
Direct Line Group  
Disabled Persons Transport Advisory Committee (DPTAC)  
Driverless Futures?  
Economides, George (personal response, associated with Oxfordshire County Council)  
Edge Case Research  
Equality and Human Rights Commission (EHRC)  
Erdunast, Paul (personal response, barrister associated with Temple Garden Chambers)  
Faculty of Advocates  
FirstGroup  
Five AI  
Forum of Complex Injury Solicitors (FOCIS)  
Future Transport London  
GoBike  
Green Dino & robotTUNER

## **Guide Dogs**

**Hatton, Dean** (personal response, associated with National Police Chiefs' Council - Roads Policing portfolio)

**Health and Safety Executive (HSE)**

**Highways England**

**HORIBA MIRA**

**Houghton, Robert** (personal response, associated with Imperial College London)

**Information Commissioner's Office (ICO)**

**Institute and Faculty of Actuaries**

**Institute for Transport Studies, University of Leeds**

**Institute of Highway Engineers (IHE)**

**International Telecommunication Union Focus Group on AI for autonomous and assisted driving (FG-AI4AD)**

**International Underwriting Association (IUA)**

**IROHMS Simulation Laboratory, School of Psychology, Cardiff University**

**ITS United Kingdom (ITS UK)**

**Kennedys Law LLP**

**KPMG LLP**

**Kyd, Sally** (personal response, associated with University of Leicester)

**Law Society of Scotland**

**Logistics UK (formally the Freight Transport Associations - FTA)**

**Marson, James and Ferris, Katy** (personal responses, associated with Sheffield Hallam University and the University of Nottingham respectively)

**Met Office**

**Mid and West Berkshire Local Access Forum (M&WBLAF)**

**Milligan, Scarlett** (personal response, barrister associated with Temple Garden Chambers)

**Mills & Reeve LLP**

**Mitchell, Christopher**

**Mobileye, an Intel company**

**Mobility and Accessibility Committee for Scotland (MACS)**

**Momentum Transport Consultancy**

**Morris, Richard** (personal response, associated with Innovate UK)

**Motional**

**Motor Insurers' Bureau (MIB)**

**Motorcycle Action Group**

**National Engineering Policy Centre (NEPC)**

**National Farmers Union Mutual Insurance Society Ltd (NFU Mutual)**

**National Physical Laboratory**

**Nova Modus**

**Office of the Traffic Commissioner (OTC)**

**Owen, Wendy** (personal response, associated with Bangor University)

**Oxbotica**

**P3 Mobility**

**Parliamentary Advisory Council for Transport Safety (PACTS) and TRL** (joint response)

**Paths for All**

**Pinsent Masons LLP**

**RAC Foundation**

**Rainbird, John**

**Reed Mobility**

**Reimer, Bryan** (personal response, associated with Massachusetts Institute of Technology (MIT))  
**Renault**  
**Road Haulage Association (RHA)**  
**Royal Society for the Prevention of Accidents (RoSPA)**  
**Scottish Courts and Tribunals Service (SCTS)**  
**Senators of the College of Justice**  
**Shipman, Alastair** (personal response, associated with Imperial College London)  
**Shoosmiths LLP**  
**Society of Motor Manufacturers and Traders (SMMT)**  
**South East of Scotland Transport Partnership (SEStran)**  
**Stagecoach Group**  
**Stellantis**  
**Stewarts Law LLP**  
**Suzy Lamplugh Trust**  
**Tata Consultancy Services**  
**Thompsons Solicitors LLP**  
**Transport for Greater Manchester (TfGM)**  
**Transport for London (TfL)**  
**Transport for West Midlands (TfWM)**  
**Trustworthy Autonomous Systems Hub**  
**Uber**  
**Urban Transport Group**  
**Vellinga, Nynke** (personal response, associated with the University of Groningen)  
**Waymo**  
**Wayve**  
**Whitfield, Peter**  
**Wu, Xinyi** (personal response, associated with the University of Edinburgh)  
**Zurich Insurance**