

Transport Committee

Oral evidence: [Self-driving vehicles](#), HC 519

Wednesday 16 November 2022

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[Watch the meeting](#)

Members present: Mr Ben Bradshaw (Chair); Jack Brereton; Ruth Cadbury; Chris Loder; Karl McCartney; Grahame Morris; Gavin Newlands; Greg Smith.

Questions 105–154

Witnesses

I: Ashley Feldman, Transport and Smart Cities Programme and Policy Manager, techUK; Mark Shepherd, Assistant Director and Head of General Insurance, Association of British Insurers; Ben Gardner, Senior Associate, Pinsent Masons LLP.

Written evidence from witnesses:

- [techUK](#)
- [Association of British Insurers \(ABI\)](#)
- [Pinsent Masons LLP](#)

Examination of witnesses

Witnesses: Ashley Feldman; Mark Shepherd and Ben Gardner.

Q105 **Chair:** Welcome to the second session of the Transport Committee's inquiry into connected and automated vehicles, otherwise known as self-driving vehicles. I am standing in temporarily until we elect a new Chair today. Perhaps, to start with, we can ask our witnesses in the first panel to introduce themselves, starting with you, Ben.

Ben Gardner: Good morning, everyone. My name is Ben Gardner. I am a manufacturing and technology lawyer from an international law firm called Pinsent Masons. I support car manufacturers, suppliers and technology companies on strategic projects in the transportation and mobility space. I sit on the connected and autonomous vehicles steering group of the SMMT and the intelligent mobility steering group of the UK Automotive Council.

Chair: Thank you. Mark.

Mark Shepherd: Good morning, everyone; delighted to be here. My name is Mark Shepherd. I am the head of general insurance at the Association of British Insurers, the UK trade body for insurers.

Chair: Ashley is with us virtually.

Ashley Feldman: Good morning, everyone. My name is Ashley Feldman. I am the programme manager for transport and smart cities at techUK, the UK's trade association for the digital technology sector. I apologise for not being with you in the room this morning. I am travelling internationally today, but I am delighted to be here remotely.

Q106 **Chair:** Thank you very much. I am sure that you know this, but if when you are answering questions someone has already given the answer you were going to give, please do not feel the need to repeat it. If you have something to add, that is always very welcome. Starting with you, Ben, in basic terms what is currently legal and not legal in the UK?

Ben Gardner: That is a very good question. First, to set the scene for the types of vehicle that we are looking to discuss during the session today, we have various types of vehicle that can go on the road, from a car to a pod, shuttle, van, bus or HGV, and everything in between. We also have different levels of autonomy that could be incorporated in each of those vehicles, ranging from level 1 to level 5.

At the moment, on the UK road network, there are instances of level 3 and potentially level 4 technologies being incorporated into vehicles. Whether they are fully legally permitted to be used on the road network is questionable. A lot of the UK road legislation was drafted esoterically. It is 40-plus years old and has not kept up with the pace of change of technology. As a result, there are gaps and grey areas, which create some uncertainty as to whether certain types of technology and functionalities in road vehicles are legal or not.



Q107 **Chair:** Is the same level of uncertainty present in other countries? Are they further ahead than us in sorting out the regulation?

Ben Gardner: The UK is probably in the top third of countries, globally. It has an incredibly developed legal framework. As I said, it goes back hundreds of years, in terms of transportation laws. That can be a good thing or a bad thing, because there is quite a complex spider's web that we need to navigate of what laws could potentially inhibit particular types of technology even though that was not the intended consequence of that legislation at the time it was passed.

Q108 **Chair:** Is what can go on in trials clearer, as opposed to on public roads?

Ben Gardner: Not particularly. The UK has issued a non-binding code of practice, which is intended to provide some guidance to organisations that are looking to pursue trials in the UK, but the fall-back position at the moment is that if that trial breaks the law, it breaks the law. There are some wider questions around public interest, on enforcing a traffic law contravention, and things like that. A black and white answer is that UK road laws could well cut across trials as well as widespread use.

Q109 **Chair:** It has been suggested in the background briefing for this session that discussion of this with the European Union could be being held up by the impasse over the Northern Ireland protocol. Is that really the case?

Ben Gardner: Now that the UK is outside the EU it is, to an extent, free to set its own regulatory agenda. However, the thing that we need to think about is that one of the UK's biggest export markets for automotive is Europe, so there is no point passing laws and developing vehicles and technologies that ultimately will not be legally compliant in one of our biggest export markets. We are also signatories to the UNECE—the United Nations convention—which a number of other countries are signatories to. To an extent, as a signatory, we would be bound to comply with any UNECE regulations on automated vehicles as well. As I mentioned, the regulatory landscape is quite complex, but that is not to say that the UK could not try to be at the forefront in trying at least to develop, understand and future-gaze what an appropriate global framework might look like.

Q110 **Chair:** Does it concern you that the working group that was supposed to be meeting to discuss this, between us and the EU, has not actually met yet?

Ben Gardner: Yes.

Q111 **Chair:** Okay. Ashley or Mark, do either of you want to add anything on the overall legislative framework?

Mark Shepherd: Maybe I could add a few points of context from an insurance point of view. We have the basis of AEVA, the Automated and Electric Vehicles Act 2018. That extends compulsory motor insurance to have to cover the vehicle as well as the driver whenever a vehicle is listed or classified as automated. That is a big change for insurance. To go back



to your original question, of course no vehicle can legally be driven on UK roads without motor insurance. That is compulsory under the Road Traffic Act. There is definitely a changing environment for insurers in the law, and potentially a changing liability environment, as the causes of collisions, or the blame for them, could be either the driver who is in charge or the vehicle. That is a massive change.

I want to make one point on trials and testing. At the moment I agree with Ben that there is still quite a lack of clarity around the legal position. Generally, it is fine to have trials, from an insurance point of view, when they are not on public roads; but obviously if they are being tested only in a safe or more laboratory-type environment, that limits the situations, or types of driver experience, or the experience of the cars. We would like greater clarity on the insurance requirements for real-world testing of autonomous vehicles on public roads, because if they are not listed on the Secretary of State's list of automated vehicles—at the moment we do not have any vehicles like that listed in the UK—they cannot be insured for automated use.

Chair: Ashley?

Ashley Feldman: Just a couple of additional points from me. First, on trialling, you mentioned the code of practice: generally, the technology sector supports having the code of practice. It has enabled some very good testing. It is very flexible and permissive, and has enabled both user-in-control and no-user-in-control testing. The pathways for doing something like no-user-in-control operations—getting the necessary approvals to conduct that test—are perhaps less clear. The pathways a company would need to go through are less clear under that code of practice. We are keen to see some thinking around how we can enable that kind of testing.

We mentioned the work going on at international level. The UK is absolutely taking a strong role in those dialogues. For us, it is very important that the UK continues to maintain chairmanship within the dialogues, especially at the UN level. Ensuring that we are harmonising at that level, adopting and influencing best practice globally and making that work for our regulatory system is something that we are keen to see continue.

Chair: Thank you. Karl McCartney wants to come in, briefly.

- Q112 **Karl McCartney:** Thank you, Chairman. This is probably for all three. Ben, it is perhaps theoretical, but given where we are at the moment with legislation, could it be, with a self-driving vehicle, that somebody who either was not 17 years old, or who was older than 17 but did not have a driving licence, could get in a self-driving vehicle and be taken from A to B? Would they be breaking the law because the self-driving vehicle is in control, rather than them, or does the law stand that it is they who are in control, or should be?



Ben Gardner: That is something that the law at the moment completely has not contemplated. As an initial answer, whoever put that self-driving vehicle into circulation would be breaking the law, because the vehicle was not approved to be used in a public road scenario. Then there are probably a host of other questions around whether a 17-year-old person would be able to be a sole passenger in a vehicle. Certainly, in the near term we are going to have what is known as level 3 and level 4 technology, where the person in the vehicle will be expected potentially to regain control if the vehicle experiences an unknown scenario. If it is a 17-year-old person who has not passed their driving test, they will not be fit to regain control of the vehicle safely. Even based on the legal frameworks that have been proposed by the Law Commission, that would not be legally permissible.

Q113 **Karl McCartney:** Mark, do you think there will be any change with the insurance? Do you think we will be insuring people or vehicles?

Mark Shepherd: We currently insure the people—the driver. In the longer term I think that is likely to shift more towards insuring the vehicle, because as the vehicle—that is, the vehicle systems—becomes more in charge, it will then be responsible, or potentially liable, if something goes wrong or causes a collision. That is the endgame, and the trajectory—how quickly we get on to that journey, given that there is probably quite a big transition period in between—is an open question. The transition period is really important, because that is when you have different types of vehicles with different technologies interacting with each other in real-world driving situations. It is the combination of the two that will create great uncertainty over the next period.

Q114 **Karl McCartney:** That leads to my next question, to you, Ashley, if that is okay. Do you think tech is up to taking on the risk that the insurance companies may want to factor into insuring vehicles?

Ashley Feldman: I think the tech sector will work positively with the insurance industry. Through trials we are already seeing some really good relationships being formed on tests. Who carries the risk is a very important question, and we will be able to work through that, but we need to get the ball rolling on getting to a place where we can have those conversations. At the moment, we are still fairly premature in actually getting into those finer points. We need to focus on first getting the primary legislation that would at least enable us to start having the conversations. The other details can be worked through with secondary regulation, and there will be plenty of time to have further discussions. At least getting the ball rolling and starting will be the first step, which the tech sector is keen to do. Yes, there is a long way to go, but we need at least to get cracking on it.

Karl McCartney: Thank you, all three.

Q115 **Ruth Cadbury:** Thank you. It is good to meet you all. In the current legislation, what are the biggest gaps and areas of ambiguity? I will start



with Ben.

Ben Gardner: That is a good question. At the moment, probably one of the biggest gaps is the approval regime. For any vehicle to be placed on to the road and sold to the public, it needs to be approved for use and go through what is known as type approval in the UK. Different types of vehicle are recognised—for example, a private car, a van, a motorbike or a trailer. There is not a single type that would exist for a self-driving or semi-self-driving vehicle at the moment, so even the entire concept of a self-driving vehicle does not particularly exist as an approved vehicle for use on the UK road network. Until we get our heads around it and begin to lay out the frameworks through which such a vehicle could be legally recognised, and an approval process is created to allow it to be approved, we are not going to get very far. There is work under way. There is an assurance and approval regime called CAVPASS, which is a kind of cross-Government and industry working group that is trying to get to the root cause of that exact question. In terms of the biggest initial gaps and blockers, that would be one that springs to mind from my perspective.

Ruth Cadbury: Mark, do you have anything to add?

Mark Shepherd: I agree with Ben about the approval regime. From our perspective we need primary legislation that will introduce a robust regulatory framework for the new types of technology that are starting to emerge, not just in the UK but abroad, to be able to use them safely on UK roads. I think that should be the ambition.

There are some insurance issues. If you will indulge me for a minute on some of those, a big ask for us in the potential upcoming transport Bill is insurer access to collision data that will be collected or stored on these vehicles. That goes back exactly to your point earlier, Karl, on the decision to be made as to whether it was the driver or the car system in control at the time of the collision. We have set out a series of pieces of data that we think insurers need in order to be able to determine who was in charge and who, therefore, is liable.

We think it is important to set out those foundations now, even if the technology is still emerging, so that we have a framework in place and ready for the future as the technology accelerates and becomes even more automated. That is vital for us. It is also vital for the vehicle manufacturers. This goes back to my earlier point that these cars cannot go on the roads if they do not have insurance. That remains compulsory, whether they are in automated mode or not, for insurers to be able to determine liability when collisions happen, and who was in charge, which may be at different points in the same journey if you turn a system off and on. That is important for the functioning of a compulsory insurance system.

Q116 **Ruth Cadbury:** Thank you. Do you want to say any more about uninsured drivers? Karl gave a particular example, but there are lots of uninsured drivers. Is there more to do in legislation about uninsured



drivers driving self-driving vehicles, or not driving self-driving vehicles?

Mark Shepherd: I don't think the issue with uninsured drivers is unique to self-driving vehicles.

Q117 **Ruth Cadbury:** But given that right over on the right-hand side of that 1 to 5 table, technically it is completely self-driving and there is some kind of operator somewhere, would you be saying that they have to be insured drivers under UK legislation?

Mark Shepherd: The reason why we have compulsory motor insurance in the UK is not necessarily to protect the driver, although it does at the moment, but to protect third parties as well. Until we have a system where every vehicle is potentially just driving itself, or self-driving with only passengers in the car, I think that a system of compulsory motor insurance, whether it is insuring the driver or insuring the vehicle, needs to be in place in order to protect against collisions that involve third parties. That might be the fault of the vehicle; it might be the fault of the user in charge; or it might be the fault of a third party driving into the back of an automated vehicle in the future.

Q118 **Ruth Cadbury:** Ashley, to what extent does current law hold back the development of SDVs in the UK?

Ashley Feldman: I am not a legal specialist, so I am not going to speak too much about our current legal system. Ben is much more the expert on that than I am. I echo his earlier point that a lot of the law we have has not caught up with some of the innovations. When we talk about autonomy, we are not necessarily just talking about public roads. We are talking about other kinds of robotics, perhaps pavement robots and things like that. There are no real legal frameworks for this kind of technology to be deployed. With something like that, local authorities are perhaps taking a bit more risk because there isn't a clear regulatory framework for them to adopt.

Legislation or regulation should not necessarily be a blocker. It should work to enable the technology. That is really what we are trying to achieve with this, and with self-driving vehicles that should absolutely be the case.

Q119 **Chair:** You all mention the need for primary legislation. I think you, Mark, said you were hoping that some of the stuff you think is needed was going to be in the now shelved transport Bill. Have you been given any indication as to whether it might be in what has been promised to be a pared-down slim Bill, or does it look like we are facing further delay?

Mark Shepherd: From our perspective, in particular on the data requirements in order to be able to determine liability and, we think, for these vehicles to be able actually to be deployed on the roads, we certainly have assurance from the Department for Transport that those are important issues that they plan to legislate for. There is a question about when that happens and whether this transport Bill is the vehicle



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that they use for it. That is why I think we would like this Committee's influence to push home the importance, we feel, of making sure that that happens.

If we are to meet the UK's ambition of being one of the world leaders in bringing this technology to the fore, which I think from an insurance industry point of view is a great thing—it is fantastic and will no doubt reduce collisions, make our roads safer and our cities and urban areas probably better and more liveable spaces, so there are huge benefits to this technology being adapted—we need to have the regulations and the legislation that underpin it keeping up with the technology.

Chair: We have the new Secretary of State before us in a couple of weeks, so we will add that to the long list of questions we have to ask him.

Ruth Cadbury: Should UK law reflect law under other jurisdictions?

Chair: We touched on that earlier.

Ruth Cadbury: I apologise; sorry.

Q120 **Chris Loder:** Good morning, gentlemen. First of all, Mark, you said that you thought self-driving vehicles would be safer. What evidence do you have to support that statement?

Mark Shepherd: We have seen some innovations where we are getting more assisted driving systems that are reducing collisions. One example is automated emergency braking where there is some quite good data. It is a system whereby, rather than you reacting and braking, it spots something in the road ahead and brakes automatically. There is some quite good data emerging that shows that that reduces the chances of collisions, primarily because the system is able to react quicker than a human can react. As technologies like that develop, and as collision avoidance systems become more sophisticated, that will help in general.

Q121 **Chris Loder:** But the overall safety suite of systems and so on is not really adequately advanced for you to be able to conclude at the moment that those vehicles will be safer than manually driven vehicles.

Mark Shepherd: It is quite a complex issue to unpick. At the moment, we have a very complex collective of vehicles on our roads, and potentially that will just get more and more complex as more developed systems come into play.

What I would point to, and what our concerns would be, would be particularly around consumer education on what their vehicle system can actually do.

Q122 **Chris Loder:** I understand the concerns, but I want to keep it short and sharp on the safety point about the evidence to back up your statement that they would be safer. At the moment, it feels to me like we might not have all the evidence available to support that statement.



Mark Shepherd: That's right.

Q123 **Chris Loder:** I just wanted to clear that up. Moving on a little bit to regulatory frameworks, I will start with Ben and then come to Mark. How do the Government propose that the regulatory environment should change?

Ben Gardner: The Government have done some excellent work which was published over the summer. There is a document called "Connected and Automated Mobility 2025", which sets out the Government's vision for what the regulatory framework should look like through to that deadline. Essentially, it recommends or endorses a number of the Law Commission recommendations from its three-year review. It includes the introduction of new legal actors—the ASDE, the NUIC and the UIC—new regulators for approval in use and accident investigation data disclosure. Some good work has been undertaken, and there is a solid blueprint in circulation. The key question from my perspective is how we can bring that to life quickly.

Q124 **Chris Loder:** How will it change the legal role of manufacturers and software developers?

Ben Gardner: It will probably create additional liability for them. At the moment, circa 95% of road accidents are caused by human error. If we take the human out of the equation and there are still accidents, it is probably going to land on the car manufacturer or the software developer putting the self-driving system on to the market.

Q125 **Chris Loder:** This is probably more a question for Mark, but I would be interested in your opinion. Given the rebalancing or reprofiling of risk away from the driver, do you think that is likely to have a positive effect on insurance costs for the driver?

Ben Gardner: Potentially. I agree that it is more a question for Mark. One point is that, with these vehicles having lots of sensors and expensive bits of equipment in them, if they are involved in an accident the cost of repair is probably going to be a lot more because they are a much higher value piece of equipment. Will it have an impact on premiums by bringing them down? Possibly, particularly over the long term, but in the short term I have to hand over to Mark on that.

Q126 **Chris Loder:** Mark, what do you think about that? Is car insurance going to be cheaper for people if they have self-driving vehicles because the risk profiles we have just articulated may go much more towards software developers and manufacturers?

Mark Shepherd: The answer is that it depends. What we need to realise is that many of these new technologies are still dependent on human behaviour and human understanding of what the vehicle's capabilities are. A real concern for us is that there is potential misunderstanding.



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We worked very closely with Thatcham recently. They did some research that showed that over 50% of consumers think that there are fully autonomous vehicles that they can buy. When you hear terminology like auto pilot, driver assist or the various terminologies that are out there, to me that suggests that many consumers would think that they can take their eyes off the road and their hands off the steering wheel, and that they do not need to go back in charge at a moment's notice. There is a big difference between the technology that we have that will require user-in-charge systems and the no-user-in-charge systems of the future.

Q127 **Chris Loder:** Do you think the term self-driving vehicle is the wrong one?

Mark Shepherd: I am not going to argue with that because we have got to a settled position on it with the Government.

Q128 **Chris Loder:** They are not self-driving, if that is what you are saying, from the insurance perspective.

Mark Shepherd: We would certainly differ between what we would determine to be assisted driving systems and automated driving systems.

Q129 **Chris Loder:** I am not getting from you at the moment that there is any clear shift in insurance responsibility away from the driver. Is there not a risk that there is an increase in risk to the driver in this case, if they do not have full control of the vehicle because of its automated capabilities?

Mark Shepherd: There might well be. I will say again that it comes down to consumer education. The real risk is that people overestimate the capabilities of their vehicle, and they presume that it can self-drive or react to various scenarios on the road that may not be part of the specific domain dimension, or whatever it happens to be.

Q130 **Chris Loder:** I am assuming that at the beginning the insurance industry will assume that if it is all brand-new you are not going to have a well-educated population, and therefore the insurance risk is likely to be higher, and therefore have an associated premium that goes with it.

Mark Shepherd: As someone in the insurance industry, I can tell you that insurers do not usually like to make assumptions about anything. They generally wait for data to underpin what that shows. If, over time, we see data that certain technologies are reducing collisions and are less costly to insurers, we would expect that to feed through and impact on premiums.

Ben is right that there are two drivers to this. One is a potential benefit and reduction that would come from reduced collisions, reduced personal injury and reduced bodily injury costs if you have fewer collisions, but, generally, these will be more expensive vehicles to repair, so that is the push up of costs that will often come with them.

Q131 **Chris Loder:** Ashley, is there anything you would like to add on the questions surrounding the legal role of responsibilities of manufacturers



and software developers, and indeed the insurance point?

Ashley Feldman: I don't have a great deal to comment on for the insurance point. Mark has covered that very extensively. We mentioned things like CAVPASS which are developing our assurance programmes. We support the role of industry being able to input to these processes. If you look to what is happening in the EU and at the UN, there is a real multitude of avenues for businesses, AV developers, those providing cyber-security solutions and a whole range of industry to input in working groups and to this work, and work hand in hand with the policymakers and regulators to design regulation that works.

CAVPASS is a very good scheme. However, compared with our neighbours there are very few ways in which industry can participate. It feels as if there are fewer routes to engage. There was a consultation issued this year which was the CAM 2025 consultation on a safety standard. That was really the first time industry had been consulted directly since the Law Commission concluded its work. There is a real need to open up some of this process. The conversations we are having are right and critical, but they need to be had directly with the people writing the policy. The industry can help with some of that as it has already done a lot of the thinking and is doing so in other markets.

As a more general point, the Law Commission has laid solid foundations in its work. It is a very balanced and very proactive framework. It is very supportive of innovation. It does not have a blame culture; it is a culture of learning. All of that good stuff is to be supported, but we need to get the ball rolling. What does the actual framework look like? We cannot even draw comparisons with other jurisdictions because we do not actually know what our framework looks like because we have not got to the primary legislation gateway yet. Building on those solid foundations is the priority.

Q132 **Chris Loder:** Thank you, Ashley. Do you support the Government's proposed approach so far?

Ashley Feldman: Yes, absolutely. Industry supports the work of the Law Commission. It did some fantastic work. As I just said, its report has some really good stuff in it. It is definitely something that can be built on and refined and will work through the technical processes on the specifics and all of the points we are talking about. There is real general support in the industry around what the Law Commission has done. There is not a sense that we do not like it and we want to start again, not at all. We really like what it has done. As I said, we need to get the primary legislation so that we can start building on those foundations.

Q133 **Chris Loder:** Ashley, do you have any observations that you can share about how the UK approach compares with international approaches in this area?

Ashley Feldman: Yes. The first is just the pace that we have seen in other jurisdictions. The EU began developing its regulatory framework in



March 2021 and it concluded in September this year. That is a great pace. The reason why they were able to achieve that was because of a very consultative approach and lots of co-operation from industry. We are sat here, at the end of 2022, talking about 2025 deployment when we do not have a timeline for legislation for the industry to give the industry certainty. The pace is definitely of concern.

It is difficult to say how our approach differs, because we do not know what the approach is from a legislative perspective. We have recommendations, and we like them, but we do not really know what the UK's wider approach is. We need to get to a point where we can look at that and work on it. We can then draw on elements of best practice, look at what other markets are doing and start to make those work for us.

Chris Loder: Thank you, Ashley. Ben, I was very quickly going to wrap it up, or I can hand back to you.

Q134 **Chair:** I was just going to bring all this together if that's okay. Basically, you all support the Government's approach, but you just want the Government to get on with it. Is there anything you don't agree with?

Mark Shepherd: I think that is a fair summary. It has been a very collaborative approach, but there are a couple of things where we would like to see it go further. One in particular is around the Government's safety ambition. At the moment, that is to bring in automated vehicles so that they have a standard equal to a careful driver. We would like them to go further than that. We think they should be using the technology as we have talked about it in terms of faster reaction times. The technology should be safer than what we see as a normal, careful driver on the road using a normal vehicle. We think the safety ambition can go further, and we should stretch ourselves to push for that in what the Government are taking forward as part of the testing regime and as part of approval for these types of vehicles when they come on the roads.

Q135 **Chair:** You also all seem to be slightly concerned that we might be getting slightly left behind. I see you nodding. Are you worried, with all the other regulatory stuff that the Government are having to do post Brexit, that there is just not the bandwidth in Government? You are nodding, Ben.

Ben Gardner: I think that is a fair comment. Other jurisdictions have got very smart to the potential societal and economic benefits of self-driving vehicles. For example, countries in the middle east and the GCC are making some quite bold announcements—rightly or wrongly—as to the timescales for advanced deployment of vehicles there. In North America, we are all aware of what is happening in California and Arizona with Cruise and Waymo and some of their automated shuttle services.

That is not to say that the UK should rush, because there is a balance between safety, public confidence and stifling innovation and commercialisation, but we need to come up with a bit of a plan and make sure that there is sufficient resource within Government to ensure that



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we remain competitive and do not lose further pace in the race to attract business and get these things on the road.

Chair: We are going to go into insurance in a little bit more detail. We have dealt with a fair bit of it. Jack Brereton is going to do the mopping up.

Q136 **Jack Brereton:** Thank you, Chair. As you say, we have touched on a lot of insurance already, but these questions are particularly directed at Mark first around the changes that are needed within the insurance sector. What sort of work has been done within the sector to look at potentially new products and what changes might be needed?

Mark Shepherd: Our initial work has been on working very closely with both vehicle manufacturers and with Government to try to understand, first, the type of technology that manufacturers are adopting, developing and how that will interplay in the vehicles of the future, and then how it impacts potentially on questions of liability, questions of claims handling, questions of repair and questions of customer service. All of that is vital for the motor insurance market of the future.

We welcome that collaboration and development, but it needs to continue. We need collaboration with Government so that we can get a regulatory framework that enables more of this type of technology to come on to UK roads in a safe way. We are not seeing that yet from an insurance perspective. That is why we are big supporters of having it, hopefully, in a forthcoming transport Bill. That will help establish a framework where insurers know the playing field they are operating in, if that makes sense.

Q137 **Jack Brereton:** And those sorts of products could not be offered now without some of that legislation. You need the primary legislation.

Mark Shepherd: It is a real challenge. It may be the case with some of the types of technology potentially coming on to the roads first that they can still be insured, because it is only in very limited circumstances that the vehicle would have control, or very limited situations. If that is done in a safe way, you could still see how they could be insured. Certainly, as we get to much more developed level 4 or even level 5 systems—although we are not meant to talk about level 5 these days—it becomes much more of an insurance challenge.

As I have said before, it needs to be listed by the Secretary of State as an automated vehicle and the information needs to be clear as to what that vehicle is. There is no sense of what that listing process looks like at the moment or what information would be provided. Insurers need to know which vehicles they are potentially insuring from a vehicle perspective as well as from a driver perspective. In the UK, that only happens through the Secretary of State's listing process.

Q138 **Jack Brereton:** As you have referred to, and as we heard from witnesses in one of our previous sessions, there is quite a range of different types



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of self-driving and autonomous vehicles. One of the witnesses, as you just said, told us not to talk about level 5. Does that create quite a lot of complexity for the insurance industry? How are you going to be able to deal with all the possible ranges of models that might come on to the market?

Mark Shepherd: Absolutely it is. Insurers innovate and adapt to new technology all the time. I am confident that we, as an industry, will be able to cater for that, provided we have a proper regulatory framework that sets the boundaries and allows these vehicles to be adopted on UK roads in a safe way. It is a challenge.

I will give one example as to why that is. You can have hardware fitments and software fitments of different types of technology in a vehicle. You can type approve a vehicle with its hardware technology, but in the future, two years into that vehicle's lifetime, the user might decide to download an app to their computer, which is essentially the vehicle, a bit like downloading an app to your phone, in order to allow or enhance some automated function in the vehicle. At the moment, the insurer would have no way of knowing that. Because these vehicles can change with what are called "over the air" updates, that presents a real challenge in being able to underwrite the risk and knowing what the vehicle is capable of.

Q139 **Jack Brereton:** This is going to potentially require quite a cultural shift for road users. Do you think that the public will necessarily fully understand their responsibilities and how they will change as a result of self-driving vehicles?

Mark Shepherd: Whether the public will understand their responsibilities, I doubt, to be brutally honest. I think there is an onus on us all, but particularly vehicle manufacturers, to place consumer education at the forefront of what they do and not to be in the pursuit of marketing or selling vehicles, overemphasising what the technological capabilities of a certain technology might be. The real risk is that that feeds through into poorer customer driving behaviour and poorer safety.

Q140 **Jack Brereton:** Is roadworthiness actually the user's responsibility or the technology's responsibility?

Mark Shepherd: We are quite some way off there being fully automated vehicles without a user in charge. Even the responsibility of the driver when they need to know when to take back control, in what circumstances they take back control and in what circumstances their vehicle might shift out of the assisted driving mode is vital if we are to have confidence in this technology, and driver/user confidence in the technology as it starts to feed through on to our roads.

Jack Brereton: Would either of our other witnesses like to add anything?

Ben Gardner: There is one point. It is a challenge because we are trying to shoot a moving target. The technology will continue to evolve, so how



can we create regulations and insurance requirements that are agile and can track how technology develops? I do not necessarily have the answer, but that is going to be another challenge that both the insurance industry and Government will need to consider.

Q141 Jack Brereton: The next question is particularly for Ashley. It is around the digital infrastructure that we are going to need. Has there been any work on what potential digital infrastructure we are going to need for self-driving vehicles?

Ashley Feldman: Yes, absolutely. The key thing to say about digital infrastructure is that it is a slight misnomer, or that perhaps there is a slight misunderstanding that we need all of our roads covered with terrestrial 4G coverage for these vehicles to deploy. That is not the case. When we talk about connected and automated vehicles, the automated part does not necessarily need connectivity to the internet to deploy. They can deploy with our current levels of connectivity. That is a key piece of clarification.

That said, there are of course many benefits to having improved coverage on the road network. Things like vehicle-to-vehicle communication, or vehicle to a traffic management system or a smart city, will require some connectivity and so will be beneficial, but it is not necessarily a prerequisite for deploying the technology to ensure that we have full coverage on our road network. I hope that is clear.

Q142 Jack Brereton: Is it going to be for the companies or more of a Government responsibility to ensure that those systems and that technology is in place—that digital infrastructure?

Ashley Feldman: There is definitely a role for Government. The Government have done some good work with the shared rural network programme and Project Gigabit. National Highways is doing a lot of excellent thinking around digital roads and how we can improve connectivity levels on the roads. We would like to see more of that and continued investment in it. It is important not just for the deployment of self-driving vehicles—connected vehicles, I should say—but for a variety of other uses, such as just being able to use your mobile phone in the car. We really want to see investment continuing there.

There is an opportunity for Government to take a co-ordinating role between transport authorities, big mobile network operators and the auto sector itself. We do not often see vehicle service operators or auto manufacturers as part of this process, so there is perhaps an opportunity for a co-ordinating role. Other countries do that quite effectively. Singapore is quite a good model of how the auto sector has been closely involved with the deployment of additional connectivity. Singapore is, of course, a very different kind of country; it has different constraints, but there is certainly a role for strong leadership in getting us there. Again, it goes back to my initial point that the self-driving vehicle industry does



not necessarily need to see any of this happen in order to start deploying their services.

Q143 **Jack Brereton:** Do you think there is more that we could do as a country? As you mentioned, Singapore seems to be a bit ahead of us. Is there anything we could do to move us further ahead?

Ashley Feldman: Just continue to invest and continue funding some very good programmes that have come through Government. TechUK has been a big supporter of things like Project Gigabit. We would like to see those initiatives continuing. It should stand us in good stead, as would working closely with the MNOs—the mobile network operators. The connectivity challenge is not taken by one actor. It needs industry and Government to work together. That co-ordinating function and open, discursive relationships with industry will be critical.

Q144 **Jack Brereton:** Obviously, we have an issue with employment at the moment in this country. Is there an issue in having the right skills to be able to ensure that we get those networks in place?

Ashley Feldman: The skills issue goes a lot further than just digital infrastructure; we have a digitising economy across so many of our public services. We have a pronounced skills gap when we think about how our economy is transforming. When we think about future mobility, yes, I think mobility is an area where we definitely need more focus on preparing the skills of the future so that we are in a good position.

A good example is cyber-security. As we have more connected vehicles and more connected systems—what we call the cyber physical infrastructure—we are going to need more security professionals in our companies and in our public sector. Frankly, at the moment we do not have nearly enough. We need to ensure that we have those skills coming through because with cyber, which is an absolutely critical part of a vehicle's safety case, we need to ensure that we have a culture of security baked in. The way to bake in a culture is to ensure that you have the right people, and enough people, in the right places.

There should be a real focus on upskilling, working with universities and schools, and ensuring that at a very base level certain technological principles are embedded into the programmes we are seeing. That is something that techUK, through TechSkills, has been working on, but there is certainly more to do. It is very important for the future of this industry.

Q145 **Chair:** We are coming to cyber-security right now with my colleague, Grahame. Very quickly, Mark, who will be responsible for deciding whether an autonomous vehicle is roadworthy in your ideal scenario?

Mark Shepherd: Ultimately, it will be the law. It will be the Secretary of State.

Q146 **Chair:** The Department for Transport, in effect?



Mark Shepherd: Yes.

Q147 **Grahame Morris:** You introduced the subject of cyber-security. I will go to Ashley to begin with, and then I will come back to our witnesses who are here in person about access to data and data security and whether you have any thoughts on that.

Ashley, there are notices all over Parliament warning that Parliament is constantly under cyber-attack. It is in the public consciousness after the cyber-attacks on the NHS, sometimes by foreign Governments and sometimes by people seeking to extort money. In terms of where we would be with autonomous vehicles and a cyber-security threat, the imagination runs riot if it was possible to hack into such a system. What are your views of the risks that self-driving vehicles pose if there was such a cyber-attack?

Ashley Feldman: I am happy to take that. First, a very important distinction and clarification that we need to make is that, when we are talking about connecting automated vehicles and cyber, it is the connected part where the risk or the attack surface is. It is less in the actual self-driving part; it is more in the connected part. Any time there is an exchange of data or a command issued, you create a vulnerability.

We can be frank about what the risks are. They are very significant. For example, the safety features of a vehicle could be hacked. What I mean by that is things like your steering, your braking, your acceleration and even the operation of the airbags. Those systems could become vulnerable and could be taken over by a malicious actor. We also have concerns about data. Vehicles store within their infotainment systems, or similar systems, potentially personal and sensitive information. There is a risk that that data could be breached.

A final way is something like a ransomware attack, which is a particularly frightening incident to happen to somebody. It would be a message that you see in your car that says, "You are no longer in control of this car. We've got control and you have to pay a ransom." It is a really scary scenario to paint for people. The good news is that there is some positive work being done. Just as safety is being architected into the vehicles that are being developed, so security is being architected from first principles, ensuring that we have the right security people who understand secure by design principles at every stage, from inception to design to manufacturing and deployment. We have to have a security hat on at all times to ensure the robustness of the systems.

Emerging regulations will mean that a developer who wants to put a vehicle forward for approval will have to have demonstrated that they have met robust cyber-security standards. There are two regulations at UN level which the UK was very instrumental in helping to develop. There is good work under way. Yes, the risk is significant, but it is not insurmountable.



Q148 Grahame Morris: That is really good evidence, and thanks for sharing your thoughts. I have a follow-up question for Mark and Ben based on the introduction that Ashley gave, in particular on maintaining the integrity of the system and the vulnerabilities of those connectivities. Where should the personal responsibility lie? We have a personal responsibility to update the software on our smartphones to ensure that we maintain the security of our systems. Is that something that lies with the individual or more broadly with who is running the network?

Ben Gardner: First of all, to answer your question, Grahame, the consequences of a cyber-attack on a connected and automated vehicle could be incredibly severe. Therefore, there will be obligations on the car manufacturer, the systems developer and the individual.

Grahame Morris: All the way through, yes.

Ben Gardner: The car manufacturer/systems developer will need to have, as Ashley mentioned, certain systems and safeguards in place as dictated at UNECE level, otherwise the vehicle will not be approved. There is an ongoing obligation to keep those systems up to date. There is then an obligation on the user, the owner, of the vehicle to download those updates, to not jailbreak the vehicle, and to keep the vehicle security system to the required standard, as dictated by the entity that sold the vehicle to them in the first place.

Q149 Grahame Morris: You mentioned that the potential consequences could be very severe. Does the industry have a view on what penalties should apply? Ashley referred to sinister actors—people who are hacking systems either for commercial gain or just out of sheer maliciousness. Is there a view on what penalties should be applied in those circumstances?

Ben Gardner: The penalties applied to the ransomware that the hacker—

Grahame Morris: The individuals behind that.

Ben Gardner: There are already criminal offences such as hacking and the like, but probably more needs to be done now to put some flesh on the bone of all the different instances, consequences and the grave risks that could result from hacking a plane or a car versus an iPhone.

Q150 Grahame Morris: There are general concerns about the security of data, especially personal data. What information or personal data would insurers require to be gathered from self-driving vehicles in order to carry out their role in insuring the vehicles and the individuals?

Mark Shepherd: The data required is not personal information. It would be things like location when the collision happened, the time when the collision happened and whether the vehicle was in a particular mode at the time the collision happened. It is basically linked to being able to establish, at the point of collision, who was in charge and therefore where the liability lies. It is purely collision data rather than personal information.



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That said, we are strong advocates of that data being stored on an independent and secure third-party server rather than insurers having to request it from the individual driver or the person in the vehicle. That is a system that we need to see deployed, given where technology will go in the future, rather than one for the present day. What we do not particularly want is to be getting into situations where we have to have court orders to be able to access data to determine liability. We want a regulatory framework and an independent third-party server where that data can be accessed.

Q151 Grahame Morris: A highly secure third-party database.

I think we are going to see a demonstration this afternoon of some of the autonomous technology. As the technology improves and as the software requirements are more onerous, presumably insurers will need more data, if we are going to higher levels, from 3 to 4 and so on. Do you have a view on that? Will it be an evolving process, and should the legislation permit that?

Mark Shepherd: There are probably different aspects of data. There is what we call collision data that we require in order to be able to establish who was to blame or where the liability lies. That is fundamental to being able to allow these vehicles on to the road. There is other data that will impact underwriting, pricing and understanding of the vehicle and its performance. That is probably much more of a commercial operation rather than needing to be underpinned by legislation.

Chair: We have touched a lot on the legislation, but my colleague Ruth Cadbury has a question.

Q152 Ruth Cadbury: I want to pick up one thing in terms of legislation. You said in answering our questions quite a lot about what needs to be in place. What would be the consequences if the UK does not legislate during this Parliament?

Ben Gardner: One of the consequences is that it may dissuade businesses from coming here or staying here to test, develop and commercialise that technology. The automotive industry could really do with a shot in the arm. I think automated vehicles, connected vehicles, and the future of mobility is a real opportunity. Providing certainty for industry, or at least positioning the UK's aspiration to become or remain a leader in the field, is crucial.

Ruth Cadbury: Ashley?

Ashley Feldman: I completely agree with what Ben says. We have companies here that are developing amazing IP. You have seen two companies before the Committee in the inquiry. There is fantastic technology developed here. It would be a real shame if those companies could not commercialise here and see the return of a lot of that investment.



There is a real risk, without wanting to sound too doom and gloom, that if we do not see legislation emerging, innovative companies investing here could basically start to atrophy. If they cannot implement their technology and see the commercial return on their investment, then, quite frankly, the UK is perhaps not a large enough market to make it worth their while. We need a timeline in place, and we need to give certainty to the technology industry that it can continue to invest, employ and innovate. Without it, I worry that we will start losing some of the momentum that we have built here.

Q153 Ruth Cadbury: Is that because other jurisdictions that are our competitive nations in automotive are actually legislating faster, and the UK is a bit behind the curve in the pace of legislative change?

Ashley Feldman: Yes, I would say so. If you look at the state of California, the last time I checked, 36 businesses have a permit there for user-in-command testing. They have three companies that have permits for commercial deployment. There is an opportunity in California to do really innovative things, as well as within the EU. From a business perspective, it would make sense to test and deploy in that market first.

Bear in mind that we have a different side drive here, so there is also consideration around that. We have different requirements. We need to be realistic about what a company's commercial objectives would be and make sure that the UK remains an investable and attractive proposition. We have a real opportunity to lead, and we have been leading. We just need to make sure that we do not lose any of that.

Chair: The final question is from Karl.

Q154 Karl McCartney: I will come straight back at you, Ashley. You recovered by saying that the UK "remains" a leader. You just mentioned California and gave an example. How does that compare to the UK? We had a previous panel member who told us that their company is testing vehicles on the road in the UK. How does the UK compare to California?

Ashley Feldman: I completely agree that we have a very exemplary trialling ecosystem here. The work of Zenzic and TRL and the CAM test bed are undoubtedly on a par with the rest of the world. We have some great infrastructure, and some really exciting concepts and use cases have been developed here. We are keeping pace in that regard. Where we are losing pace is the ability to commercialise some of this innovation and actually start to see what the commercial models are and how they could work in live driving scenarios. Unfortunately, that is not as easy to do here as it is in other markets. The technology is evolving. It is moving forward, and it needs to explore commercialisation. It can do that in other jurisdictions. It cannot do so in the same way here. I think that is the key point. Our ecosystem is exemplary. We just need the legislation to support it.

Karl McCartney: That is great to hear. Thank you for that clarification. We all want the UK to remain at the forefront of course.



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Chair: Thank you very much indeed, gentlemen. That was a really interesting and informative session.