

# PARLIAMENTARY DEBATES

HOUSE OF COMMONS  
OFFICIAL REPORT  
GENERAL COMMITTEES

Public Bill Committee

## AUTOMATED AND ELECTRIC VEHICLES BILL

*First Sitting*

*Tuesday 31 October 2017*

*(Morning)*

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### CONTENTS

Programme motion agreed to.  
Written evidence (Reporting to the House) motion agreed to.  
Motion to sit in private agreed to.  
Examination of witnesses.  
Adjourned till this day at Two o'clock.

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**not later than**

**Saturday 4 November 2017**

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**The Committee consisted of the following Members:**

*Chairs:* † MR ADRIAN BAILEY, SIR EDWARD LEIGH

† Argar, Edward ( <i>Charnwood</i> ) (Con)	† Mann, Scott ( <i>North Cornwall</i> ) (Con)
† Brown, Alan ( <i>Kilmarnock and Loudoun</i> ) (SNP)	† Rodda, Matt ( <i>Reading East</i> ) (Lab)
† Duffield, Rosie ( <i>Canterbury</i> ) (Lab)	† Stephenson, Andrew ( <i>Pendle</i> ) (Con)
† Efford, Clive ( <i>Eltham</i> ) (Lab)	† Stewart, Iain ( <i>Milton Keynes South</i> ) (Con)
† Foxcroft, Vicky ( <i>Lewisham, Deptford</i> ) (Lab)	† Tracey, Craig ( <i>North Warwickshire</i> ) (Con)
† Hayes, Mr John ( <i>Minister for Transport Legislation and Maritime</i> )	† Turner, Karl ( <i>Kingston upon Hull East</i> ) (Lab)
† Jones, Graham P. ( <i>Hyndburn</i> ) (Lab)	† Western, Matt ( <i>Warwick and Leamington</i> ) (Lab)
† Kerr, Stephen ( <i>Stirling</i> ) (Con)	Farrah Bhatti, Mike Everett, <i>Committee Clerks</i>
† Knight, Sir Greg ( <i>East Yorkshire</i> ) (Con)	
† Letwin, Sir Oliver ( <i>West Dorset</i> ) (Con)	† <b>attended the Committee</b>

**Witnesses**

David Williams, Technical Director, AXA Insurance, and Chair, Autonomous Driving Insurance Group

Iwan Parry, Head of Connected and Autonomous Vehicles, Transport Research Laboratory

Ben Howarth, Senior Policy Advisor, Motoring Liability Insurance, Association of British Insurers

Diana Holland, Assistant General Secretary for Transport, Unite Union

Adrian Jones, National Officer for Road Transport, Unite Union

Rob Johnston, Assistant General Secretary, ITF

Robert Llewellyn, TV Presenter, Fully Charged

# Public Bill Committee

*Tuesday 31 October 2017*

*(Morning)*

[MR ADRIAN BAILEY *in the Chair*]

## Automated and Electric Vehicles Bill

9.25 am

**The Chair:** Before we begin, I have a few preliminary announcements. Please switch any electronic devices off or to silent. Tea and coffee are not allowed during sittings, but there is an adequate supply of water. Today we will first consider the programme motion on the amendment paper. We will then consider a motion to enable the reporting of written evidence for publication and a motion to allow us to deliberate in private about our questions before the oral evidence session. In view of the time available, I hope we can take those matters formally, without debate.

*Ordered,*

That—

(1) the Committee shall (in addition to its first meeting at 9.25 am on Tuesday 31 October) meet—

- (a) at 2.00 pm on Tuesday 31 October;
- (b) at 11.30 am and 2.00 pm on Thursday 2 November;
- (c) at 9.25 am and 2.00 pm on Tuesday 14 November;
- (d) at 11.30 am and 2.00 pm on Thursday 16 November;

(2) the Committee shall hear oral evidence on Tuesday 31 October in accordance with the following Table:

**TABLE**

<i>Time</i>	<i>Witness</i>
Until no later than 10.30 am	Automated Driving Insurers Group; TRL; Association of British Insurers
Until no later than 11.00 am	Unite; ITF
Until no later than 11.25 am	Robert Llewelyn, presenter, Fully Charged
Until no later than 3.00 pm	Society of Motor Manufacturers and Traders; RAC Foundation; Petrol Retailers Association; Institute of the Motor Industry
Until no later than 3.45 pm	Quentin Willson, Journalist and TV presenter
Until no later than 4.15 pm	National Grid; UK Electrical Vehicle Supply Equipment Association; UK Power Network
Until no later than 5.00 pm	TRL; FiveAI

(3) proceedings on consideration of the Bill in Committee shall be taken in the following order: Clauses 1 to 16; Schedule; Clauses 17 to 19; new Clauses; new Schedules; remaining proceedings on the Bill;

(4) the proceedings shall (so far as not previously concluded) be brought to a conclusion at 5.00 pm on Thursday 16 November.—(*Mr Hayes.*)

**The Chair:** The deadline for amendments to be considered at the first line-by-line sitting of the Committee was the rise of the House yesterday, and the next deadline will be the rise of the House on Thursday for the Committee's

meeting a week today. [*Interruption.*] I have just been informed that the deadline will in fact be one week on Thursday.

*Resolved,*

That, subject to the discretion of the Chair, any written evidence received by the Committee shall be reported to the House for publication.—(*Mr Hayes.*)

**The Chair:** Copies of written evidence that the Committee receives will be made available in the Committee Room.

*Resolved,*

That, at this and any subsequent meeting at which oral evidence is to be heard, the Committee shall sit in private until the witnesses are admitted.—(*Mr Hayes.*)

**The Chair:** We will now go into a private session to discuss the questioning.

9.27 am

*The Committee deliberated in private.*

### Examination of Witnesses

*David Williams, Iwan Parry and Ben Howarth gave evidence.*

9.34 am

**Q1 The Chair:** We now resume our public sitting and will hear evidence from the autonomous driving insurance group, TRL—the transport research laboratory—and the Association of British Insurers. I remind all hon. Members that questions should be limited to matters within the scope of the Bill and that we must stick to the timings in the sittings motion agreed by the Committee. For this session we only have until 10.30 am. Will the witnesses please introduce themselves?

**David Williams:** I am David Williams. I am technical director at AXA Insurance and chair of the Autonomous Driving Insurance Group.

**Iwan Parry:** I am Iwan Parry, the head of connected and autonomous vehicles at TRL, the Transport Research Laboratory.

**Ben Howarth:** I am Ben Howarth. I am senior policy advisor for motoring liability insurance at the Association of British Insurers.

**The Chair:** The first question is from Clive Efford.

**Q2 Clive Efford (Eltham) (Lab):** This is a question about insurance, but it is open to any of the witnesses to answer. When automated vehicles and conventional vehicles share our roads, will questions of who is liable for accidents become more complicated?

**David Williams:** I do not think they will become more complicated, because I think the information that should be made available from the autonomous vehicle will make it much easier to establish what has happened. If you think of the sensors that are involved in getting the vehicle around safely, there are traditional cameras, lidar, radar, ultrasound and all those sorts of things; that will give a much more complete picture than we currently have. A lot of insurance claims at the current time are based on different opinions with very little evidence to substantiate them. We still send people out

to measure skid marks in the road, for instance; so we will be moving to a much clearer but more granular position. There will be a lot more data, so I suppose it will be more complex in that way, but I think, in terms of establishing who is responsible, things should be clearer.

**Iwan Parry:** I would add that it is quite important that we establish with these technologies that that capture of the data that David has described is a requirement of the vehicles. That really builds on the kinds of data that are captured by vehicles today but which are not necessarily available for investigators when it comes to investigating road traffic accidents, which could be very useful for in-depth investigations, in some cases. Therefore, as vehicles become more complex, with a greater ability to capture external data in the moments before a collision, we believe that it is very important that those vehicles are able to preserve that information and make it available to the appropriate and authorised investigators, in terms of understanding what has happened during that incident sequence.

**Q3 Clive Efford:** Should the Bill actually specify what information should be retained and recorded?

**Iwan Parry:** It could do. There is a mechanism in the Bill, in terms of the list of vehicles that would be approved as an automated vehicle, and potentially part of qualifying for that list might be that a vehicle would fulfil certain required criteria.

**Q4 Clive Efford:** Will vehicles continue to record driver performance, for instance, and collect data when it transitions to being driven manually?

**David Williams:** The capability is there. I think we are then drifting into data that motor manufacturers would not necessarily want to share with third parties. They would argue that maybe that driving information is something that they could use for different business purposes. There is currently a big debate in the telematics market about whether there will still be a future for separate telematics boxes being fitted in these vehicles to provide insurance and other solutions when the vehicles are being driven manually; but certainly there would be the capability to record that information.

**Q5 Clive Efford:** Can I ask about the transition from an automated vehicle to manual? There is a time lag; research has been done into that. At what point is the driver responsible, therefore becoming the insured party, during the transition from automated vehicle to the driver taking over?

**Ben Howarth:** My view on that would be that when the transition is from the driver to the car, the driver has to be responsible for what is happening to some degree throughout the whole of that transition phase. Once they have actually got confirmation that the car is in autonomous mode, that is the point when they are no longer responsible. In reverse, when the car is transitioning back to the driver, the same applies, but the driver is not responsible until they have taken full control of the vehicle. I think that is the easiest way to deal with that.

**Q6 Clive Efford:** You started your answer by saying, "In my view," and that suggests that there are other views.

**Ben Howarth:** I do not know whether other people dispute that. That would need to be consulted on in the process of—

**Q7 Clive Efford:** So in all the data we collect it is possible to pinpoint the moment when the car transitions from manual to automated and back again.

**David Williams:** We are involved in a number of the Government-backed consortia. There is Venturer in Bristol; the first trials that were carried out with the Venturer vehicles and in the simulator were with regard to the handover. There are two elements that need to be decided on. I agree with Ben that you should not make somebody responsible until they have fully taken control, whether that is the machine or a human being, but nobody has really worked through that. The other aspect is about making sure that the vehicle has controls that do not try to hand over too quickly. As insurers, one of the things we are very concerned about is that handover. People may be surprised at how long it actually takes a human who has been disengaged to get up to speed, so to speak, so that they are alert enough to be able to drive the vehicle safely. That is why it will take a while for European vehicle manufacturing regulations to catch up, but there will be regulations that require minimum periods and indicators and signalling during that handover phase, because that is essential for keeping these safe.

**Ben Howarth:** A key point is that while there are lots of data that other parties—police, investigators—might want, insurers are clear that we only want the data when a collision has occurred to confirm whether the car was in automated mode or not. I do not think we are looking to use the Bill as a way of grabbing loads and loads of data and tracking cars from A to B.

**Q8 Clive Efford:** I have one last question. If you have all your data from an accident from the software in the vehicle, which tells you that the vehicle performed perfectly, but there was an accident with a driver who is driving the vehicle manually, is the assumption from the insurance company that you are not going to pay out because everything functioned perfectly with the machine?

**David Williams:** No, that is the opposite of what the Bill is trying to achieve. There will be accidents on the roads where nobody is to blame, as there are now. If you can have an accident with a human driver where nobody is to blame, you can have that with an automated vehicle. For instance, a vehicle is driving carefully down a road but there is some black ice and it skids off and takes out a bus queue—I know that is a bit of a dramatic scenario—but everything has functioned perfectly. The Bill makes it clear that is an accident—injury has been caused by the autonomous vehicle—and it would be paid for by the insurer. In that circumstance there is unlikely to be any recovery from the motor manufacturer, but the whole point of the Bill is to give the general public the confidence that if somebody is injured, we do not have to worry about whether we are going to claim that the software was defective. If somebody is injured by an automated vehicle, there will be virtually a strict liability on the insurer and we will deal with that claim.

**The Chair:** I have had Graham Jones, Karl Turner, the Minister, Iain Stewart, Oliver Letwin and Craig Tracey indicate that they want to ask supplementary questions. Is there anybody else? I will take the Minister next.

**Q9 The Minister for Transport Legislation and Maritime (Mr John Hayes):** Ben, some of us have obviously been round this track before with the previous incarnation of

[Mr John Hayes]

the Bill, and you will know that since then we have made some changes to it. One of the changes was the agreement to define a list of automated vehicles to create clarity. One of the criticisms of the earlier incarnation of the Bill was that that was not clear enough. Do you think we have made progress there?

**Ben Howarth:** Yes, I think so. I think the definition that you have used in the Bill is clear. To me, it is pretty unambiguous that we are talking about cars that are being entirely driven themselves. I anticipate that there will be a pretty detailed consultation on how you actually draw up the list of vehicles and define what is and is not an automated vehicle. We are obviously very keen to be involved in that and to provide views. Within the industry and within the Association of British Insurers' work, we have made a bit of progress in working out what we think the criteria for an automated car are, and those are views that we definitely want to feed in. So, yes.

**Mr Hayes:** May I ask another, Chairman? Would that be allowed?

**The Chair:** Yes.

**Mr Hayes:** I do not want to hog the questioning.

**The Chair:** I will see that you do not.

**Q10 Mr Hayes:** I take that as read, Chairman. There was a lot of debate on Second Reading about the possible safety benefits of automated vehicles, and questions were asked about what that meant for insurance premiums, for example. What is your view on that? Clearly it is early days, but do you anticipate that safer vehicles will lead to easier insurance and lower premiums?

**Ben Howarth:** Yes, I think it is very clear. We have a very competitive market for insurance. If we see claims costs coming down, which much safer vehicles would definitely do, we would be looking at a similar effect on insurance premiums. We cannot say exactly what will happen until we have seen the cars in real life.

**Q11 Mr Hayes:** So the legislation is welcomed by the industry.

**Ben Howarth:** Yes, it is very welcomed by the industry. I think it is very clear that the legislation and broadly the development of automated driving are something that insurers are genuinely enthusiastic about. In terms of the work we do in the ABI, it is one of the areas where we get the most engagement and interest from our members.

**Q12 Karl Turner (Kingston upon Hull East) (Lab):** Off the back of the Minister's question, clause 1(1) defines "autonomous", or rather the vehicles that could be classed as "safely driving themselves". That does not seem very tight to me. Does the definition not need to be tighter? Does it not give the Secretary of State an awful lot of power? I do not know whether you have a copy of the Bill in front of you. Clause 1(1) states that autonomous vehicles

"are in the Secretary of State's opinion designed or adapted to be capable, in at least some circumstances or situations, of safely driving themselves."

The clause allows the Secretary of State to come up with a list of vehicles that he or she thinks are capable of being driven safely without being operated manually at all. The definition does not seem tight to me.

**Ben Howarth:** I would make two points on that. On the one hand, we would obviously want to see robust and good consultation on how that list is put together. We would want it to be transparent and we would want the opportunity as an industry to feed into that. The wording does have an advantage in that it clearly states "safely driving themselves". One of our views is that we want a clear and unambiguous distinction between cars that are completely hands-off—maybe not for the whole of the journey, but for parts of the journey—versus cars where the manufacturer might be saying, "You can do a lot with the automated functions, but you need to be there hovering over the steering wheel as a backstop." We do not want those things to be blurred, and the definition in the Bill does that.

If I can make one further point, being on the list is clear—there is a definition—but there will also be a role for insurers to play in thinking about, "We have a claims history and car A is brilliant and has a really good safety record, while car B might not be a very good functioning car, but it has got itself on to the list." Insurers will want to take a view on that in terms of how they approach those vehicles in offering products.

**Q13 Karl Turner:** Thank you very much for that answer. Clause 4 describes vehicle software updates. It concerns me that—if this is a vehicle that is completely autonomous—the onus is put on the passenger, if you will, to update the software. They have to agree manually to update software. Is that the right position? Should it not be automatically updated?

**Ben Howarth:** I think the onus to do those software updates should definitely be on the manufacturer. They should ensure that the system works, and I think that links back to part 1. The Bill says that where a wilfully negligent person deliberately ignores what the manufacturer wants them to do and finds a way around the manufacturer's systems and still takes the car on the road, it would be unreasonable to say that that person is still a victim. I think you need this protection in the Bill, but you also need robust measures to ensure that people cannot override the safety-critical updates.

I think "safety-critical" is the key phrase. That places a strong incentive on the manufacturer to say, "If the update is safety-critical, you have to ensure that the driver knows." We have got to be absolutely clear that there is a distinction between "nice to have" upgrades, that perhaps involve a slight improvement in the maps functionality or something like that, and an upgrade where if you do not have it, the car is potentially unsafe and we have a problem.

**Q14 Karl Turner:** Finally, while I have you here, the current situation for vehicle insurance is driver-centric. The driver of the vehicle is the insured person. The Bill provides for a situation where the vehicle is insured. Is that definitely the way we should be going? Should there be some more provisions?

**Ben Howarth:** I think what we have in the Bill is the right way. When these cars first come to road, most users/drivers will probably use the automated function

for 10% or 20% of the journey. That is why we want to keep to a system with an all-in-one approach. The Government have described this as

“a rolling programme of regulatory reform”,

so if we really move to having cars without steering wheels or genuinely A-to-B autonomous cars we probably need to look again at what the right approach to insurance is, but I think the technology is a long way from that.

**Q15 Karl Turner:** What would happen with an uninsured vehicle, then? At the moment, the Motor Insurers Bureau compensation scheme kicks in. Would that apply to automated vehicles? If not, should that be stated in the Bill?

**Ben Howarth:** We think it definitely should apply. I know that there have been discussions between the MIB and Department officials about the correct way to do that, and it will be interesting to see how the Committee approaches it. My understanding is that the reason for not having the MIB scheme in the Bill is that it is not in the Road Traffic Act 1988 either, so the existing system is not directly in primary legislation. I think the MIB will be assured so long as the Government confirm that it is still the ultimate fund of last resort, which it definitely should be. It does not necessarily need to be in the Bill, but we would like absolute clarity on how it will work.

**Q16 Iain Stewart (Milton Keynes South) (Con):** I would like to follow up on Mr Turner’s point about clause 4 and the respective obligations of the manufacturer and the driver to update software. Clause 4(1)(b) refers to “updates that the insured person knows, or ought reasonably to know, are safety-critical.”

That strikes me as very woolly. I would be grateful for your opinion on where the balance should lie. I accept that if someone has wilfully not installed updates or overwritten them, or something, they become liable. However, if the manufacturer has sent through an update, but the person has not taken it to the garage or downloaded the software—or whatever—at what point do they become liable? I have an update waiting for my iPhone, but I have not got round to doing it. That is not safety-critical, but is there a parallel? Do we need a tighter definition than “ought reasonably to know”?

**David Williams:** It is interesting that you mention the iPhone, because that is exactly the debate that we had in our early discussions. Currently, for most things you buy, you have the right to refuse a software update. You are allowed not to get round to doing your iPhone update; you can continue to bypass it. Our view was that when we are talking about a tonne of metal travelling at high speed on the road, people should lose that right, because it would enable them to take risks with other people’s lives. We think the updates should be implemented straight away, because we see them as being improvements. As for whether they are safety-critical or not, it would be a damn sight easier if all updates had to be implemented immediately and the responsibility fell on the manufacturer, but then you are drifting into trying to impose something in UK legislation that some European territories and motor manufacturers have probably not really thought through yet.

The idea of saying that people have to install safety-critical updates immediately is something that we recommend. As for the detail of how it should be dealt with in the Bill, I have to plead ignorance, but the

reason for pushing for it is that we honestly believe that if a manufacturer has updated the software, it is to make the vehicle perform better. These are not iPhones that can only annoy other people; these are vehicles that can kill other people. Those updates should be mandatory in whatever way we can make them so.

**Q17 Iain Stewart:** Forgive me, but I am not clear how these updates would actually happen—whether you would have to take the vehicle into a dealership or garage.

**David Williams:** Tesla currently does them over the air.

**Q18 Iain Stewart:** If you were rushing out of the house at 9 o’clock and you got an email from the manufacturer that said, “Version 1.7 is now available and you need to install it”, and you thought, “I’m running late for a meeting—I’ll do it at the end of the day”, would that fall foul?

**David Williams:** I think the Bill is trying to allow for some delay, but a reasonable delay, and does not want people to deliberately and unnecessarily stall. If an update is coming through—if they have found a fatal flaw in the software that is likely to make your vehicle veer off the road—my view is that that vehicle should be immobile until the software update is implemented. The motor manufacturers would be able to build that into their technology and machines if they wanted to.

**Q19 Iain Stewart:** If the upgrade is so safety-critical that the car will not function without it having been installed, is that something we should put in the Bill?

**David Williams:** My understanding is that that sounds very good in principle, but how do you define that extent? Many upgrades might have a degree of safety-critical improvements in their nature. How would you define the seriousness of the upgrade?

**Ben Howarth:** Clause 4(6)(b) is a definition—that feels to me like it means that it is unsafe to use. If you started saying at this stage a car must be immobilised, we would potentially be legislating for things that we do not know the manufacturers will do in every circumstance. There might be times when the car could move. It might be safe to move it at 20 miles per hour or so—I am just speculating. Is it right to put it in the Bill at this stage? I would definitely say that it is something that needs to be carefully defined and thought about when you create the list of automated vehicles. I know we keep coming back to “the list is everything”, but I think the list is the mechanism by which many of the potential problems of the Bill will get solved.

**Q20 Graham P. Jones (Hyndburn) (Lab):** I am interested in the collection, retention and distribution of data and also the issue that has just been raised by my colleagues about the software prescription; whether it will be prescribed that software must be updated and all the problems that might ensue from that.

Let me lay out an example and ask your view of the Bill. If somebody switches to manual from automated and is involved in an accident while in excess of 30 miles per hour. What happens next? How much of that data becomes available in the case that ensues? For instance, I presume that speed would be used, but what about the on-board cameras or anything else? How much of this data will be kept, retained and used from the functions

[*Graham P. Jones*]

of the vehicle for a case in which there is an accident with a driver in manual mode? Does the Bill provide a robust framework for accidents and insurance claims and what about road safety? Will it enhance road safety or are we stopping at legitimate information for insurance companies? Should the Bill also include data made available so that road safety is improved?

**Iwan Parry:** The basis of the question is around the availability of data. My technical background is in forensic accident investigation and in order to investigate accidents—to get to the root cause—we need to start at the before-accident period and understand as much as we can. We are limited today to things such as skid marks, as David referred to earlier, as the tools to reconstruct those accidents. The kinds of data that are potentially available from electronic vehicles increase the amount of data significantly. With the cameras, radar, lidar—light detection and ranging—and ultrasonic sensors we can get a very clear picture of what was going on around the vehicle at the time of an incident. When we look at the consequences of an incident, we can put the two together and have a very clear understanding from establishing liability and whether that indicates that the vehicle in some way behaved unreasonably—or that the driver, pedestrian or cyclist that it was interacting with behaved unreasonably given the context of the situation. That gives us the information that would allow us to make a determination on liability. I think that is critical to insurers, to police investigating such incidents and to road safety in the future.

To advance the future legislation on autonomous vehicles, we will need a method to understand what is going wrong in the real world. We will also need a method to use that information to improve our understanding of vehicle functioning in the real world and how that can be improved by manufacturers or by legislators applying the right tools to ensure that vehicle performance is improved over time.

**Ben Howarth:** If I could add the insurance perspective on that, for what we need to do for this Bill—to establish whether the car was in automated or manual mode—we need a fairly limited amount of data. You mentioned speed, but we do not necessarily need speed to do that. We just need to know whether it was in automated mode. There are potentially lots of other uses for car data for the police and for accident investigators. In a disputed claim with contradictory evidence in court, you could find it a lot easier to solve cases with data, but I would draw a distinction between the data that insurers need to make this Bill operational and the data from cars that would be useful to understand claims. That might be a valid concern for vehicles not covered by this Bill; as cars get more technically sophisticated with more assisted functions, you might want to understand more about how it works for any car. I think whether it is reasonable to ask for data is still best managed via a judge.

It is also important, if we want the data, that manufacturers record it. My understanding is that at the moment, if you hit a pedestrian in an accident, you will not necessarily trigger an airbag so the data that the car keeps on a rolling basis are not automatically recorded or stored and they would not be available. As part of the work to define an automated car, we need more

clarity about what data are recorded and stored and about the process to ensure that the data are sent to the right people at the right time. An insurer is one party that would want some of the data.

**Q21 Graham P. Jones:** I am interested in your final comment that there needs to be discussion about what data are kept—perhaps the Bill does not go into that in detail. Road safety is important, and some of the data could be used to improve it. I have concerns, therefore, and I ask the question again that you partially answered: does the Bill provide a robust framework for improved road safety through data retention, collection and distribution, particularly with insurance companies? You answered by saying that perhaps it does not, but I wonder what the other two think.

**David Williams:** My view is that the Bill undoubtedly aids road safety because it will encourage the use of safer vehicles on the roads, but in terms of data, no—the Bill does not have a robust framework for provision, storage and transmission of those data. I think that is partly because of the stage that we are at. Some things are contentious and some are not. Data sharing is really contentious, whether because of general data protection regulation or because motor manufacturers are concerned about infringement of their intellectual property. We are very keen for there to be some clarity about the storage and transmission of data, the form that data are transmitted in so that they are useful, and the speed of transmission—there is no point us getting the data three months later. That is not in the Bill.

When we had the original discussions, we talked about data. We were still forming our opinions about what data would be required—as I say, that is very contentious. Our view was that it was better to support a Bill that would be part of a rolling programme of legislation and acknowledge that more needed to be done on that data piece than to delay it. We feel that delaying connected and autonomous vehicles hitting our roads would have a negative impact on road safety.

**The Chair:** Waiting to ask questions, I have Sir Oliver Letwin, Craig Tracey, Alan Brown, Edward Argar, Scott Mann and Sir Greg Knight. Is there anybody else? Clive Efford, you wish to come in with another?

**Clive Efford:** If we have time.

**The Chair:** If the questioners and the panellists could be very pithy and pointed, that would be helpful.

**Q22 Sir Oliver Letwin (West Dorset) (Con):** My first question requires just a yes or no answer, and I am interested to know whether the answer is the same from all of you. As has been mentioned, in clause 2(1)(b) there is a reference to the vehicle being insured, which is a new concept, and at the end of clause 2(1), as David Williams said, strict liability of the insurer is established. Do you read that combination as meaning that strict liability attaches to the insurer of the vehicle?

**David Williams:** Yes.

**Iwan Parry:** I am not an insurance professional, so I will not answer that question.

**Ben Howarth:** Yes.

**Q23 Sir Oliver Letwin:** My second question: do you agree that it is perfectly possible that the person who is the passenger/driver, who is in the vehicle, might have a different insurer?

**David Williams:** They may have another motor policy that would cover them for driving other vehicles. That is common practice in the UK but not every policy provides that.

**Q24 Sir Oliver Letwin:** No, but it could happen.

**David Williams:** There is a chance, I suppose, but I do not think that we would have a dual insurance situation, because the other insurance would insure the actions of that individual, whereas the autonomous policy would cover the actions of the autonomous vehicle. If the vehicle is operating autonomously, it is not being controlled by that driver and therefore they would have no liability.

**Q25 Sir Oliver Letwin:** I understand that logic, but if I have understood you, both of you are accepting that the driver/passenger—the person—could have a different insurer.

**David Williams:** They may have, but it may not apply in the event of an accident.

**Q26 Sir Oliver Letwin:** Indeed. My third question: do you accept that strict liability would operate for the insurer of the vehicle, even if the driver had inappropriately transferred control of the vehicle to the vehicle?

**David Williams:** Transferred control of the vehicle to the—

**Q27 Sir Oliver Letwin:** Yes, so the driver is sitting there driving the vehicle, and he does whatever it is that you do to switch it to automated use, but does so under inappropriate circumstances. Do you accept that under clause 2(1), as it is written at the moment, strict liability would nevertheless attach to the insurer of the vehicle and not to the insurer of the driver?

**David Williams:** I think so, because if the vehicle is operating autonomously, strict liability applies. If it is about to crash into a wall and he has flicked the vehicle into autonomous mode, but it has not had the opportunity to take control, we come back to one of the earlier questions—

**Q28 Sir Oliver Letwin:** No, I am assuming that it has had the opportunity to take control.

**David Williams:** So it has taken control.

**Sir Oliver Letwin:** It has taken control, so strict liability attaches to the—

**David Williams:** That is my take on it, but I would say that it is difficult for me to imagine circumstances where doing that would be inappropriate and where someone would still be able to switch a car into autonomous mode.

**Iwan Parry:** I think it is unlikely that an autonomous system engaged in that kind of transfer would accept control in a situation where it was then unable to avoid a high-risk scenario of some type, resulting in some kind of incident.

**Q29 Sir Oliver Letwin:** But if I have understood you, that would entirely rely on whether, as a matter of fact, the technology had that effect. In other words, there is nothing in the Bill to prevent that situation.

**David Williams:** But we want the man in the street to know that if a vehicle is operating autonomously, compensation will be available. That is why there is strict liability. We might not like the particular scenario, if we can think of one that might happen, but I agree: my interpretation is that strict liability would apply.

**Ben Howarth:** The difference being that the driver might not have the same rights.

**Q30 Alan Brown (Kilmarnock and Loudoun) (SNP):** If we go back to control of data, Ben, you said that more clarity is needed on what data will be kept and shared. David, you said that the Bill does not look like a robust enough framework, but that you would not want it to be held up. Surely if it is believed that the Bill does not provide a robust enough framework we should look at making amendments, rather than holding the Bill up. Are there amendments that we as parliamentarians should consider?

**David Williams:** I am not aware of the planned timetable. There are two aspects: first, the vehicle has to get on the list and insurers then need to decide whether they will insure those vehicles. If, for some reason, a motor manufacturer decides they are either not capable of making or are not going to make any of that information available even if it ends up on the list, it will struggle to get insurance in the UK market.

There are lots of things that do need further discussion. These vehicles are not really going to be on the road for a number of years, so setting out the UK's intention from a headline regulatory view and commenting that data need to be available while we work on that is one thing. I am not fussed as to whether or not it is an amendment, but it would be sad if the amendment took two years to get through because the motor manufacturers' lobby blocked it.

**Ben Howarth:** I would also point out that a lot of the technical side will be taken up at a UN/ECO global level, so it might not be feasible to define it in the Bill and then have to change it. The more sensible route might be to see how the technical discussions go at global level and ensure that the way the list operates is robust, rather than put it in the Bill.

**Iwan Parry:** There are also a number of projects going on right now that will be helping insurers and safety experts to define what those kinds of criteria should be, and the data that should be retained. It would be worth giving those projects time to report on those requirements.

**Ben Howarth:** If you are interested, we have put a report out and defined what data we think we would want as part of this Bill for the insurance industry, and we have published that.

**Q31 Alan Brown:** The hon. Member for Hyndburn has talked about safety in relation to these projects looking at data protocols. Should that also encompass looking at safety and how the car was being driven or controlled, whether manually or in automatic mode? It has been said that insurance companies would only want data in the event of a collision, but it would be very tempting for insurance companies to want a lot more data. Even now, you can get an insurance policy for young drivers that involves fitting a black box into the car. The insurance company is obviously monitoring the operation of that car to keep the premiums down. Surely there is temptation to want more data and to do

[Alan Brown]

more. It may seem hypothetical, but if you use the internet then your history is used as an advertising and promotion tool. Therefore should there not be strict controls in terms of data control in the future, so that the data are not used?

**Ben Howarth:** I think there is a distinction to be made in relation to the data that the insurers would need as a condition of this Bill. The industry would love more data, as that helps with pricing. However, it is appropriate to ask what the insurance company needs and then to regulate that in order to make this Bill work. I refer to insurance companies, but actually it concerns what information the claimant would need for the purposes of verifying whether or not they have the right to make a claim. That is a key distinction. The more data that the insurers can potentially get on a commercial basis the better, but we recognise that there have to be controls on that.

**Iwan Parry:** I would add to that: as mentioned earlier, there is a difference between the limited amount of information that an insurer might require to understand whether the vehicle was being controlled by the vehicle or controlled by a driver, and information that could be beneficial from a road safety point of view that could also act as evidence from a capture and perspective point of view. This information will inform future policy at governmental level and potentially at legislative level. That is a more detailed source of data, and it would also be of the type that would assist more detailed investigations of what went wrong if an automated vehicle had an accident.

**Q32 Craig Tracey** (North Warwickshire) (Con): I declare an interest as chair of the all-party group on insurance and financial services. I would like to pick up on two points. Coming back to data: obviously, claims prices hinge on the quick sharing of data. In order to pay a claim, it will be necessary to know whether or not the car was in automated mode. Are there any current technical barriers between insurers and manufacturers that are going to delay that? Are there issues that you foresee causing problems?

**Ben Howarth:** We probably do not yet know enough about getting the data from the car to the insurance industry. Some work has started to be done via the Motor Insurance Bureau: as well as being the guarantee fund, they do a lot of data-sharing for the industry. We are confident that once we have data from a car, then the process of getting it to the insurer and settling the claim will be efficient. We would want confirmation that we can get it from the vehicle, but we have already started discussing that with the Society of Motor Manufacturers and Traders. That is something that can definitely be achieved within the timescales required.

**Q33 Craig Tracey:** May I make just one quick point? I echo some of the concerns colleagues have raised about clause 4(4)(b). The Bill talks about the damage suffered by an insured person arising from an accident occurring as a direct result of failure to install safety-critical updates. How would it be assessed whether the accident was a result of an installation not being made? Who would resolve those disputes? Can you see any problems around the insured potentially not seeing it as being a contributory factor to the accident? How would those disputes be resolved?

**Iwan Parry:** That relates directly to the point I have just made about the detail of the data. In that scenario, in order to resolve the question you would require a more detailed amount of data than purely who was in charge of the vehicle. It would be a question of what the variety of contributory factors to that collision were, what the vehicle systems saw and what they did in response to what they saw, and whether that can be related back to the functionality of the piece of software that was due for install. You would require a much more detailed set of data to resolve that question.

**Q34 Craig Tracey:** Would you envisage disputes going through the same channels as they currently do for disputes on liability?

**Ben Howarth:** In that kind of event, yes, I would.

**Q35 Edward Argar** (Charnwood) (Con): I have a very quick question, following on, I think, from the answers that were given to the Minister's question, in which you all said you anticipated that, if this goes to plan, it will see safer vehicles and therefore a reduction in accidents, leading to a reduction in premiums, which is clearly a positive for all those paying them. What assessment has been made, or what is your view of, any likely impact of that on the insurance market and industry? As I understand it, car and vehicle insurance premiums to a degree underwrite other insurance policies across the industry—that is the way it is structured. What impact do you think significant reductions in premiums would have in terms of disruption of the insurance market?

**David Williams:** Lots of work has been done on this by insurance companies and by market consultants, and they predict substantial reductions in the total premium pot. A couple of statistics—we think that 93% or 94% of accidents are caused by human error. I have driven in these machines; they are already much better drivers than most human beings. When we look at things like automated emergency braking systems—that is just one component of what will be the autonomous vehicle of the future—we know that they reduce accidents by 15% and injuries by 18%. So even if they cannot prevent the accident completely and absolutely, because they are braking better and faster there are fewer injuries.

We see a substantial impact. There will probably be a slight increase initially because you will have more expensive gadgets strapped around the periphery of vehicles, but once we see a higher proportion of these vehicles on the road, consultants predict a 50%-plus reduction in the total motor premium market. From our perspective, we are planning in that regard. The good thing is that it will not happen overnight, and therefore as we see motor premiums reduce we can move our staff and our capital on to other lines of business.

**Q36 Scott Mann** (North Cornwall) (Con): According to some of the figures I have seen, 63% of the adult population hold a valid driving licence, so by definition 37% of people currently do not. Of the 63% who do, many are precluded from driving because of health conditions or because they have lost confidence behind the wheel. My question is, first, do you think that this Bill will increase social mobility? Secondly, do you think it will increase car insurance volumes in your marketplace? Thirdly, you mentioned to my colleague that premiums will be lower for automated vehicles,

so I want to seek reassurances about whether you think the Bill will reduce premiums for people who have mobility problems.

**David Williams:** One of the consortia we are involved with, Flourish, is looking at cyber-risks and also at mobility, at segments of society that currently feel cut off—people, who perhaps are disabled, living in a rural area and not able to get out and about. That is one of the reasons we want this Bill to go ahead and are keen to support it. Absolutely, it will support that.

In terms of volumes of cars on the road, there are numerous different models. Overall, the view is that there would be fewer vehicles, because this will enable car sharing on a scale that has not previously been seen, but in terms of number of miles covered, there are diverging opinions. One thing that might happen is that, because it will be as easy to get a car even if you do not own one as it is to get a train or similar, more people will move to transport on the road, which will drive up the number of miles. There are other views that there will be an integrated transport network, meaning that more people use public transport because they are much more able to link into it than they are now. I think the jury is out in that regard.

It will absolutely reduce premiums. The other aspect is that even when we have a mixed car park of manual and automated vehicles, because 50% of those vehicles will be safer, although the premiums on manual vehicles will decrease less, they will be less exposed and involved in fewer accidents, so overall that will have a positive impact from a premiums perspective, even on manual vehicles, as the number of automated vehicles increases.

**Q37 Sir Greg Knight (East Yorkshire) (Con):** So what you are saying is that if the owner of a vehicle that is capable of being fully automated updates his or her software, has a vehicle with no warning lights displaying that there is something wrong and uses the vehicle in fully automatic mode in circumstances where it is proper to do so, there should be no liability on the owner, who is actually travelling as a passenger?

**Ben Howarth:** Yes.

**Q38 Sir Greg Knight:** So you are saying that in a scenario where a vehicle is in fully automated mode on a smart motorway, the Highways Agency suddenly drops the speed limit from 70 to 50 and the car in automated mode is slow enough in responding to be clocked by a police speed camera on a bridge, in those circumstances, the insurers of the vehicle should pay the speeding fine?

**David Williams:** No.

**Q39 Sir Greg Knight:** Why?

**Ben Howarth:** We are covering the liabilities. I think they are already there in the Road Traffic Act 1988, on insurers, but it would be extending those existing liabilities to the vehicle. I do not think we are responsible for criminal offences such as speeding now. I think you would have to find another way of—

**Q40 Sir Greg Knight:** But surely the passenger cannot be held responsible if he is relying on the car to drive him safely to his destination.

**Ben Howarth:** You may need to look at whether or not there are additional criminal offences associated with automated cars. Certainly, this Bill does not compel insurers to pay speeding fines or any other. Ditto if an autonomous car parked illegally in a parking space. If it injured someone or damaged property, that would be the insurer's responsibility; if it parked and received a parking fine, that would be the responsibility of the owner of the vehicle or another party. You may need to look at that in legislation, but I definitely do not think the Bill does that at the moment, and we would not support it if it did.

**Q41 Sir Greg Knight:** But you agree that it would be wholly unjust for the passenger in those circumstances to have his licence endorsed and be fined when he is relying on the vehicle, which is slow to respond?

**David Williams:** But in all honesty, if someone was on a smart motorway and had connected an autonomous vehicle, they would be more likely to notice the reduction in speed than you or I would. It is a hypothetical question. I think the point, from our perspective, is that the Bill does not compel insurers to pay these sorts of fines. Yes, there are some other legal aspects that need to be debated, but this is about extending the Road Traffic Act 1988 to provide protection in line with the RTA, not about other criminal offences.

**Q42 Sir Greg Knight:** So do you think it is fair in those circumstances that the passenger gets a fine?

**David Williams:** I think the vehicle will be more likely to notice the reduction in speed than a manual driver.

**Q43 Sir Greg Knight:** As far as the data are concerned, you are saying, I think, that you would prefer clarity. You would prefer some rules to be laid down about what data should be kept and who has access to them. Is that right?

**Iwan Parry:** Yes.

**Q44 Sir Greg Knight:** Rather than a free-for-all before the courts, with the court deciding in each case who gets what.

**Iwan Parry:** Yes. I think there should certainly be some clarity around the types of data that we would regard as beneficial and that could qualify for the list that will be established. The vehicle's ability to make available those data would potentially be a qualification criterion.

**Q45 Clive Efford:** Mr Parry, following on from the questions from the right hon. Member for West Dorset, can you clarify how the vehicle knows when it is not appropriate to be in automated mode and therefore prevents the driver from flipping over to that?

**Iwan Parry:** This is very much part of the research and development that industry is doing right now, but the expectation on manufacturers providing access to an automated control system would be that, in that handover situation, the vehicle would be assessing the circumstances of the traffic and the road conditions surrounding it and would accept the handover only if it was able to respond appropriately to that traffic scenario.

**Q46 Clive Efford:** So the vehicle is constantly taking in data on its environment—the surrounding area—and therefore is switching itself off, making it impossible for the driver to switch over to automated mode.

**Iwan Parry:** The vehicle would be expected to be aware of what is around it at all times, and during a process—as it was described earlier—of handover, whereby the person or the vehicle that is in control at a particular time will remain in control until the other half of the equation is ready to assume control, that readiness to assume control can be determined only by sensing what is around it in the specific scenario that the vehicle is driving in, and accepting that it is now able to assume that control in a safe manner.

**David Williams:** This is a key point, because there will be many vehicles that can operate autonomously—initially, at least, only in certain environments, certain designed domains. For instance, I would imagine that the first ones that come to market will be able to operate on motorways and dual carriageways. *[Interruption.]* Exactly. Therefore, if you are travelling down Clapham High Street and you want to flick the vehicle into autonomous mode, it will not accept control.

**Q47 Clive Efford:** Let me ask about transition, because the studies in Bristol suggested that vehicles slowed down significantly after the transition from automated mode to driver mode, because the driver was being excessively cautious or very cautious, which can lead to more dangerous circumstances. Is that an issue for insurers?

**David Williams:** It is something we need to be aware of, which is why we asked Venturer to do handover first of all; I think guidance needs to be provided. I think it is less likely to be a safety risk and more likely to be a congestion risk, but the other aspect is that when we are doing these tests, we are deliberating doing on, off, on, off. In my vision of the future and, I think, the way motor manufacturers are designing vehicles, it will not be like that. It might be that you drive on the country roads because you enjoy that and then you hit the motorway and flick the vehicle into autonomous mode for the next couple of hours. But yes, we need to understand and provide appropriate training and guidance on the handover; that is something we still need to understand more about.

**Q48 Alan Brown:** As insurance premiums come down, as predicted, in the future, is there a concern or risk that the Chancellor of the Exchequer will increase the Government's take from insurance premiums, so that all the savings are not passed on to the driver?

**David Williams:** We always worry about insurance premium tax increasing.

**Q49 Mr Hayes:** You talked, in relation to the question from my hon. Friend the Member for North Cornwall about people who are disadvantaged not currently being able to access transport and so on, and subsequently, in answer to the question from the hon. Member for Eltham, dealt with predictable, standard routes. Where an autonomous vehicle is acting more like a bus in effect—it is on a standard journey—presumably it will be particularly appealing to those who currently cannot access transport of their own, because it will be, as you put it, in straightforward mode; even in a straightforward mode, many people currently cannot drive a car, because a visual impairment or a disability prevents their doing so. Is that a future you envisage?

**David Williams:** I think there will be, in the same way as there are many variations even to the Uber model now, many variations to autonomous vehicles. I think

the advantage will be that you will not have to stick your hand out to stop a bus; the vehicle could potentially come into your drive and then go back out and continue its journey.

**Mr Hayes:** Precisely. A journey to a hospital where there is not currently a bus route would be a good example.

**The Chair:** Order. I am afraid that brings us to the end of the time allotted for the Committee to ask questions. I thank our witnesses on behalf of the Committee for their evidence and I also thank Members for their admirable self-control and brevity.

#### Examination of Witnesses

*Diana Holland, Adrian Jones and Rob Johnston gave evidence.*

10.30 am

**The Chair:** We will now hear evidence from Unite and ITF. We have until only 11 am for this session. Will the witnesses please introduce themselves for the record?

**Adrian Jones:** I am Adrian Jones. I am Unite union's national officer for road transport.

**Diana Holland:** I am Diana Holland, Unite's assistant general secretary for transport.

**Rob Johnston:** I am Rob Johnston, assistant general secretary at the ITF.

**The Chair:** I am going to start again with Clive Efford.

**Q50 Clive Efford:** I do not know if I need to declare an interest: I am a member of Unite and the GMB. When automated and conventional vehicles share our roads, will questions of who is liable for accidents become more complicated?

**Diana Holland:** I think that is the crux of the matter. Obviously, while the Bill covers a very limited aspect of what the important role of these changes can mean, we are particularly concerned, as the previous discussion demonstrated, that the only concentration is assuming issues around private drivers, whereas the implications of this go into all modes of transport where automation will apply.

We are particularly concerned about the current methods of employment, particularly within certain parts of the road transport industry. That means that liability will be very unclear. There are all sorts of drivers who are accounted as owner-drivers but, actually, in the way in which the contract has been established they are workers to all intents and purposes.

We are very concerned, for example, about bogus self-employment contracts and leasing of vehicles: all those things that will mean that all kinds of people could end up being held liable when they should not be in those circumstances.

**Q51 Clive Efford:** So should the Bill address those issues more directly and in more detail?

**Diana Holland:** We have two areas of concern. One is about issues that are not addressed by the Bill but have implications for the impact of driverless technology on the transport industry and on transport policy in our communities. I think there are problems and the House

of Lords report is extremely clear about all the outlying issues: job losses, job creation, job shifts. We would want that to be part of the discussion that goes on around this.

We are very concerned about some of the wording, specifically in clause 3(2) and clause 4(4), (5) and (6) around the software engineers. All sorts of people could be encompassed within that or it could lead to knock-on effects on people who work in the transport industry or in software engineering. They could be implicated either by the employer concerned or by the policies of the insurance company. We would want that to be addressed.

**Q52 Clive Efford:** We have just heard from insurance companies that for many years to come automated vehicles will not operate in many areas but mainly on major routes such as smart motorways, which clearly has an implication for people who drive long distances. There is the issue about transition from being automated to manual and vice versa. Is that an issue of concern for you and the people you represent: the delays in transition and the impact that taking over a vehicle has on the behaviour of a driver?

**Adrian Jones:** It absolutely is. As was said in the previous session, when a driver is not concentrating on driving, their attention is elsewhere and the transition back to driving is a slower process. The agreed trials for platooning are part of the debate and should not be forgotten. If you have three vehicles in a platoon, you have a driver in the front vehicle that is controlling the other two vehicles, what are the other two drivers doing? When they come to the end of the motorway or road where the platoon is taking place, what do they then do?

We also have the concern raised in this very room about 18 months ago. The report from AXA suggested over £5 billion a year savings in labour costs, due to the introduction of automated vehicles. That clearly says to me that there is either a downgrading or lack of recognition of professional drivers who are carrying freight, passengers or anything else. I think there is a real concern that the Bill does not cover any of those aspects at all. If it is not covered in this Bill, it needs to be covered somewhere.

**Q53 Mr Hayes:** Dealing with your point, Diana, I think you are right. Perhaps I can provide some reassurance. I do think you should contextualise this debate in a bigger debate. I do not think it is something you can do in legislation. You are absolutely right that the implications over the longer term oblige a proper lateral discussion—quite a serious discussion—about our transport future. If I can briefly make a case for the Bill, Chairman, it tries to steer a way between being too prescriptive about what that future looks like and putting enough of a framework in place not to inhibit research and development and further technological change. There is a big contextual discussion to be had, and I hope the Bill might stimulate that in the time we have here and in Committee, but it is going to take place over a longer time in a bigger forum, I suspect.

On the specific point about job growth and job shift—you made a very balanced point about how some jobs will change, some will grow and some will shift—I want to come back to the issue raised by previous witnesses about people who currently cannot or do not drive. In rural areas, for example, in many places in Cornwall, Lincolnshire, Dorset and similar places, half

the parishes do not have access to public transport. Can you imagine a future where autonomous vehicles will fill that void and provide a link to public transport, perhaps buses, trains and so on, and therefore boost the use of that transport for people who currently cannot get there. They will have access to autonomous vehicles because they are straightforward things to drive.

**Diana Holland:** Cards on the table: Unite is not opposed to technological advances, autonomous vehicles or anything in this area. It is about how it is done, the basis on which it is done and making sure that safety is absolutely critical. We are slightly concerned about the current moves. We believe that risk-based health and safety management needs to be properly built into this and we are slightly concerned that that is not recognised. We are not opposed to this in any way—it provides all sorts of opportunities—but because the overall approach is about private individualised driving rather than about the implications for the whole road transport industry of passengers, as Adrian was saying, with road haulage and taxis, it is also going to operate on a marine basis, in agriculture and all those other things. The concentration on private vehicles is going to advance this in such a way that I think there is a danger that it skews the potential for developments by concentrating on one aspect to the exclusion of the others. Does Rob want to mention your wider point about the commissioners?

**Rob Johnston:** To pick up on a couple of points, I think some of the challenges are about the definition of automation, which is at the root. We work with a number of global institutions, employers' bodies and manufacturers. We have developed a framework of five layers of automation. When you look at what we are discussing, at least three or four of those layers need to be included. On the point just made about people who cannot drive potentially being able to drive, there is also a question about the definition of the amount of automation needed to give them that mobility. It is very difficult not to consider the whole piece. In the end, it will not be a journey from where we are today to suddenly having fully automated vehicles. It will be a process as technology slowly comes through. In particular, platooning, which is one of the areas that we are likely to see in a relatively short time period, would not be covered under the Bill in its current format.

**Q54 Mr Hayes:** May I add a quick point? I am grateful for your welcome—I am not surprised; I have worked very closely with Unite—and I take your point on that. Would it be fair to say that you hope, as I do, that as well as this necessary legislation we can have a bigger debate to ensure that this fits into the broader narrative about the transport future?

**Diana Holland:** Absolutely. We believe that representatives of the workforce need to be part of that discussion but, as trade unions, we are often not included in those kinds of debates. We have discussions with employers where we have recognition, but plenty of people operate in the industry and there are areas where our voices are not heard. We think it is essential that they are.

**Q55 Mr Hayes:** Wherever my ministerial footprint touches, the unions are always involved.

**Diana Holland:** We are, and we will place on record that that is the case.

**Q56 Karl Turner:** I declare my interest as a member of Unite, the GMB and the RMT. I wonder whether you have any concerns about the skills gap and training. Should there be something in the Bill about forcing or encouraging manufacturers to train people?

**Diana Holland:** I think it is absolutely essential that there is the transport skills infrastructure body that exists at the moment. I was looking at its terms of reference—

**Karl Turner:** I am grateful that the Minister is nodding very enthusiastically.

**Mr Hayes:** It is a good point.

**Diana Holland:** I was quite concerned when I looked at those terms. Although there is some implication about developments in technology, it seemed that we would need to look at the way it is worded to ensure that it properly reflects this. Otherwise, the Bill will not provide the opportunities that it needs to. So yes, that is a really important point.

**Q57 Clive Efford:** On the issue of vehicles being connected in convoy on the motorway, are you saying that there should be a specific reference or clause in the Bill about connected vehicles and how they behave?

**Rob Johnston:** There is a definition that the ITF and a number of organisations such as the European Automobile Manufacturers Association and the International Transport Forum at the OECD have worked to establish. It sets out five layers of automation. We believe that will be a useful reference point for looking at how to define what automation really means. In those five layers are different degrees of automation. The previous evidence alluded to that in some ways.

**Q58 Clive Efford:** So those layers go from driver assisted right through to full automation?

**Rob Johnston:** Yes, absolutely.

**Q59 Clive Efford:** Are you satisfied that that is covered in the Bill or should there be reference to those five?

**Rob Johnston:** No, we believe that the Bill should be expanded to cover those five areas. If you look at technological development, it is likely that those layers will come to fruition in their current format.

**Q60 Clive Efford:** Would those five layers cover all forms of transport as time goes on, not just lorries on smart motorways but vehicles that are passing one another, approaching one another in built-up areas and communicating with one another? Would it cover all those areas of automation?

**Rob Johnston:** Yes, it would. The layers run from driver assistance at the lowest level to full automation at the highest level, and everything in between.

**Q61 Clive Efford:** Is it your understanding that automation governs all aspects of the vehicle, so they cannot speed and will obey the speed limit at all times?

**Rob Johnston:** I think that there is a question, which the Bill tries to deal with, on regulation. In order to accept the fully automated vehicle, you would have to

accept a number of criteria around the algorithms that would do that, and they pose some questions. Essentially, the vehicle would need to be able to make choices between certain decisions. For example, if the vehicle was involved in an accident or there was a crash, it would need to have an algorithm that would define which course of action it took. I think that area really needs further regulation. In Germany, for example, they have established a body to deal with that: High-Tech Strategy. In September 2017, they came up with some guidance on how they believe these algorithms should be programmed, and that is a useful reference point.

**Clive Efford:** Thank you. That is very interesting.

**The Chair:** I have Scott Mann and the Minister. Does anybody else want to ask this particular panel a question?

**Graham P. Jones:** Yes.

**The Chair:** I have got Graham as well. I will take you next, Scott.

**Q62 Scott Mann:** Briefly, in the last session I talked about some of the conditions and the loss of confidence that people have. Do you accept that the Bill increases social mobility?

**Diana Holland:** On the face of it—

**Scott Mann:** Just a simple yes or no.

**Diana Holland:** The potential is there, but it is not automatic unless a range of other things are followed up at the same time. It would be fantastic to find ways of developing this so that there is social inclusion for both rural areas and for disabled people, who are currently denied opportunities, but it has to be part of an overall approach to an integrated transport policy. Otherwise there is a danger that we just end up replicating congestion of one kind with another, with different insurance. However, there is a way of using this to develop a whole range of things, including much broader social inclusion.

**Rob Johnston:** I would add, as I did earlier, that if we are providing transport mechanisms, whatever they look like, for individuals who cannot drive for whatever reason, we need to provide a transport mechanism that allows the transport method to make decisions for them. That needs to be regulated and we need to be confident that the decisions being made by that vehicle, whatever type it is, are the right ones. That is determined by the algorithms and software behind it, so we need to have confidence that those are right. That is because you could potentially take vulnerable people and put them into a vehicle they are not in control of.

**Q63 Graham P. Jones:** What impact will the Bill have on employment if it goes through?

**Diana Holland:** Again, it does not have to have any impact on employment in terms of the two relatively minor areas that it could be argued that it covers; but the potential is there to enable a wholesale change to a different method, and ultimately saying that the professional driver no longer has a role. There are extremes in approaching this. We would say that it does not have to do away with employment, but plenty of estimates have

shown that if it is introduced in one way, that is the effect it will have.

Our immediate concerns regarding the phrasing of the Bill are on the impact on those people currently employed, or under a range of contracts, and responsible for a vehicle, who would find themselves potentially liable in a way that we hope is not the intention. We really think that needs to be looked at to ensure that it does not encompass all kinds of people who we do not think should be liable in those circumstances. There are specific concerns around taxi drivers who own their own vehicles. There are issues around road haulage, where certain people are required to establish themselves as a limited company or to be self-employed to have jobs, but the definition bears questions. We need to ensure that we are not extending liability here beyond where it ought to be, when the operation is run and owned by a third party.

**Rob Johnston:** If I can briefly add to that answer, KPMG produced a report that said there are potentially 25,000 additional jobs directly working in the automation industry by 2030. A potential 320,000 jobs that could be created, but there is a caveat to that: Government policy is needed to address the growing skills gap, otherwise there is a risk of losing more than £50 billion in GDP per annum. Those are statistics provided by the transport systems Catapult.

**Q64 Mr Hayes:** Finally, I want to return to Mr Turner's point on skills, which I nodded vigorously at, as he noted. Presumably to facilitate the discussion you are suggesting—the bigger debate about the transport future—it would be helpful now to begin dialogue with the FE sector and with manufacturers on apprenticeship frameworks. That is beginning. As you described, Rob, you are having those kind of discussions, but I am of a mind that the Government should now facilitate some more of that. Would you welcome that? I am inclined to take the view that while it is true that we cannot exactly predict either the character or timing of the technology, initial discussions of the kind that you proposed would be helpful. Is that about right?

**Adrian Jones:** Yes, I would certainly say that we would welcome the opportunity. While the date for roads full of fully automated vehicles is an unknown, as is the impact, our members already have concerns. In manufacturing, the apprentices needed are not engineering apprentices in the traditional sense; they are software engineer apprentices. In road transport, we have fitters and engineers who are up to their elbows in grease, but in just a few years' time they will be up to their elbows in keyboards, iPads and screens, which is a completely different skillset.

We also need to recognise that there is concern about skills. As you know, Minister, there is a widespread acknowledgement of a driver shortage in the UK. You already know my views on that. Our members already have concerns that the technology is being used as a smokescreen in effect to say, "We can use this technology to address that skills shortage", but it will not do that, because employers will see it as a way of reducing cost, rather than filling the skills gap.

One expert that I heard on the venerable Radio 4 was asked about the job shift of a bus driver when that bus was fully automated. The expert said, "Jobs will be created. There may be a café on the bus and they could

work in the café." That is not comparable work. Yes, it is a job, but going from a skilled position to working in a café—no disrespect to any café workers—is not maintaining a standard of living or the same income to that family or the Treasury. There has to be a real debate now, not only on the future, but on the impact that new technologies are having on the transport industry and workers today.

**Q65 Mr Hayes:** So you would welcome an initiative, if I launched one, to have that kind of dialogue.

**Diana Holland:** We would, very much.

**Adrian Jones:** Yes.

**Q66 Mr Hayes:** While you acknowledge, reasonably so, that we cannot be definitive about exactly where this will lead, we need to start engaging with all the partner organisations that can make the skills you describe a reality.

**Diana Holland:** I think the approach we see all too often is the race to the bottom that means that even those employers that want to invest are forced to undercut in order to win contracts. There is an opportunity here for Government to say that nobody can undercut on the basis of the standards we think should be set and operating in this industry. If we are approaching skill levels in that positive way, that can be extremely helpful, because it means we are saying that people are recognised for the skills they have, and having those skills will mean we get the kind of industry we want.

**Q67 Clive Efford:** If, under clause 4, an employer were to compel a driver to take a vehicle on the road that does not comply or have all the safety-critical software downloaded, should that be a criminal offence on the part of the employer? What should be included in the Bill to deal with that?

**Adrian Jones:** I am not sure if it would be included in this Bill. There are already regulations in force through the Traffic Commissioners' office for operators who infringe on maintenance, for example. The key, for this Bill, is how the driver would know whether or not that vehicle is fit. At the moment, a driver is expected to carry out a daily check to ensure that the mechanical aspects of the vehicle are fit for road use. How can they check that the software has been updated appropriately, and who will be held responsible if it is not? The Bill does not cover that, and it would be helpful, certainly for drivers and for the confidence of other road users, if, when I see an automated vehicle on the road, I know that it has been properly updated and the vehicle has a professional driver or worker who has ensured that the updates have been made.

**The Chair:** If there are no further questions, I will move on. I thank the witnesses for their evidence.

#### Examination of Witness

*Robert Llewellyn gave evidence.*

10.57 am

**The Chair:** We will now hear oral evidence from Robert Llewellyn. We have until 11.25 am for this session. Can you introduce yourself for the record?

**Robert Llewellyn:** Hello. My name is Robert Llewellyn; I am a writer, TV presenter and electric vehicle driver.

**Q68 Stephen Kerr (Stirling) (Con):** The Bill addresses

fundamental issues involving electric and automated vehicles that are revolutionising how drivers and we as a society see driving. Do you think that the Bill as it stands will address the issue of public confidence in new technologies?

**Robert Llewellyn:** It starts to go towards that. I am doing many public appearances to discuss the impact of electric vehicles. It is effectively a disruptive technology, in the same way as cell phones and the internet. It has elements of those disruptive aspects, which are never all positive. There are some positives, but there are definitely some negatives. One of the things that it highlights is the ownership model. That is certainly something that motor manufacturers are very focused on: the way we use cars at the moment.

It is the 90:90 dilemma; I have never heard anyone dispute that. At the moment, 90% of the cars we own are idle 90% of the time. When you look at it from that point of view, any other business or industry that kept 90% of its assets idle for 90% of the time would not be in business. It is a really difficult challenge, and I do not have an answer. One of the answers that is emerging, as you have just been hearing, is autonomous vehicles. There are so many complexities, as you have listed wonderfully in the Bill so far. When I started to read it, I got a bit of a fuzzy brain, but that is the actor side of me; it is not an enormous intellect.

The challenges that it raises are fascinating. I fuel my own cars with my own fuel, which I make in my house. That has never been possible before. It is conceivable that, if I lived in the right part of the world, I could have drilled down, extracted oil, built a small refinery and filled my car, but that is pushing it a bit. This technology allows you to do that, although not all year round and not 100% of the time. How do you legislate for that? How do you tax that fuel? All those things are thrown up in the air. It feels a bit wild west at the moment.

That is one aspect of it. The other aspect is the charging infrastructure. Anyone who has an electric car will talk to you about it for a year, because it is such an emerging area. When I first started driving electric cars in 2010, there was one rapid charger in the country. That belonged to Mitsubishi in Cirencester and you had to arrange to go and visit it, so it was like a day out to go down to Cirencester and use a rapid charger. For 90% of the time it did not work; all the instructions were in Japanese; and no one understood Japanese at Mitsubishi, so it was not very reliable.

However, now, if you are stupid enough—I have done it in the winter—you can drive from London to Edinburgh in a Nissan Leaf. It takes a long time, it is a miserable trip, and it is quicker on the train, but it can be done. I have driven all over the country in various electric cars, now relatively easily, so there has been a dramatic change in the infrastructure, but there are very few electric cars on the road. If you doubled the numbers overnight, there would be issues with that. I think 40% of the people in this country do not have somewhere off the street to park their car, so where do they charge them? I will not go on too long.

**Q69 Stephen Kerr:** So is there anything that needs to be addressed in the Bill?

**Robert Llewellyn:** Sorry, yes, that was your question. There is one crucial thing that I think could be addressed. It has been addressed in other countries. Ireland and

California are two places that I know about where there is one system for paying for electricity. Everyone who uses an electric car is happy to pay for the electricity, but the system is so complex. I could get the collection of cards out of my wallet that I need to be able to use all the chargers, and very often I do not have the specific card for that charger. In Ireland there is one system, an app that you have, and you can use any charger. It is operated by many different companies. They all get paid for it, but you just have one thing. A combination of either that or touch to pay should be addressed.

You can buy a bag of crisps with touch to pay, but you cannot buy electricity from a charger. I know there are complexities and legal difficulties and expense, but that would really make a huge difference. The most common complaint I hear is, “I haven’t got a wallet big enough to hold all the cards.” And you need membership and subscriptions. All that needs to go so that you literally go up to a charger, pay for the electricity you are using and move on. You do not have to join a club to use a Shell petrol pump. You just pay for it. That is a really essential thing.

**Q70 Karl Turner:** You have described very well the problems that we have. I declare an interest as the owner of an electric vehicle. Finding somewhere to charge it is often extremely difficult. One of the other problems is home charging and the requirement for off-street parking. I noticed very recently Hackney Council’s lamppost charging. What do you think about that? Do local authorities need to do more to support councils to provide charging points?

**Robert Llewellyn:** That is a very good system by Ubitricity, a German company. My primary enthusiasm about it is that it is incredibly easy to use. You drive up to it and plug your wire in. The wire has a box that communicates and tells the company how much electricity you use. You plug the other end into your car and it starts charging. You do nothing. We need that frictionless ability to do that.

I cannot remember the figures, but there are many hundreds of thousands of suitable lampposts. One of the aspects of the technological change we are seeing is when a lamppost is converted to LED lights. It has extra juice—electricity—that you can take off it without blowing anything up. It does not need any other infrastructure changes. It is a very simple system. It requires lampposts that are on the kerb side of a pavement, which not all lampposts are, but there are certainly hundreds of thousands of them. They have fitted a great deal of them and they have been very popular.

**Q71 Karl Turner:** I suppose my point is that the cost to install this will be reduced. It will probably be a lot less costly.

**Robert Llewellyn:** It is in the hundreds rather than thousands.

**Q72 Karl Turner:** It is, but we have a situation where local authorities are cash-strapped. Not every local authority has a lot of electric vehicles; I think Hull City Council has two charging points. They are hoping to get to the dizzying heights of 70 at some point before 2020, and they are doing their best. Should we not encourage local authorities with incentives—crudely, I mean cash incentives—to ensure that the equipment is available for everybody?

**Robert Llewellyn:** That would be ideal. One of the other problems is that the technology is changing so fast. I recently drove over a strip of road just outside Paris that has an induction-charging strip set in it. I do not think that is going to happen, because I cannot imagine the cost of putting that in the M1—it would be in the billions—but these induction plates for static charging, so when you are parked the car starts charging, are quite common now. That technology is getting cheaper.

It is really difficult—I would feel nervous suggesting that anybody invest an enormous amount. There have been failures in public-invested charging points: they are in the wrong place, they break down, they are not maintained or they are not run by the company that set them up. There have been plenty of examples of that. This is a rapidly emerging technology that keeps changing. Take even the wire you use. Finally, a bit like phones, there is a standardised type 2 connector that goes in every socket and goes in every car, but even that was a mystery a while ago. I would have a certain reluctance in saying, “Yes. Make all councils install thousands of chargers,” because they might be the wrong ones in the wrong place.

An organic development is happening with private companies, including supermarkets, that are starting to put them in car parks. Shell is now putting rapid chargers in its forecourts. It is happening, but quite slowly. I think it is probably chicken and eggging like that—so there are more cars, then more chargers, then more cars, then more chargers. I would not know how to suggest where to put them.

**Q73 Karl Turner:** Finally, the Bill makes it mandatory for fuel stations to provide charging points. Does that need to be in the Bill?

**Robert Llewellyn:** I think that is a really good idea. If there is one group of fuel suppliers that could probably afford it without too much stress, it is the garage chains. They seem quite keen to do it. I think they can sense a change in public attitudes, which is why Shell has gone ahead and has done what it is doing. I know BP is doing the same. I do not know about any other companies, but it makes sense. All I would beg them to do is to put in nice chairs, wi-fi and reasonable coffee, because you tend to be in the garage a bit longer with an electric car than you are with a petrol car.

**The Chair:** Before I call the Minister, I have him, Graham Jones, Iain Stewart, Matt Western, Scott Mann and Matt Rodda indicating that they wish to ask questions. Are there any more? No. Well, you can do the maths as well as I can. Will Members be as brief as possible with their questions? And Robert, we really enjoy your eloquence and insight, but if you could be as pithy as possible in responding, that would be helpful.

**Q74 Mr Hayes:** Robert, I will try to be pithy too. Broadly, from what you have told us so far, you welcome the Bill. Your journey to Edinburgh will be helped by the fact that the Bill suggests that fuel retailers should have charging points, because you could access them on the way, but you also say that we need to do more on the spread of charging points. Is that a fair summary?

**Robert Llewellyn:** Yes, I think so—I am trying to be pithy.

**Q75 Mr Hayes:** I have one other point—an old chestnut that I make no apology for roasting one more time—about the look and feel of charging points. I am keen that they should have some familiarity, so that people see a charging point and know what it is. Is that a good idea?

**Robert Llewellyn:** Yes, very much so. That has certainly been discussed a lot. If nothing else, like at a garage forecourt, if a row of charging points are under a canopy—say, at a motorway services or at a garage forecourt—with a specific kind of colouring to attract you to it, that would be nice. I do not know whether you can legislate for that, but it would be a great benefit so that you are not standing in the rain when you plug your car in.

**Q76 Mr Hayes:** And you hope that Her Majesty’s Opposition will move an amendment on the provision of coffee, do you?

**Robert Llewellyn:** A bit of coffee. Or a herbal tea.

**Q77 Graham P. Jones:** Robert, you are a great enthusiast for automated and electric vehicles, so the Bill must please you no end. I have just a broad question and then a specific question. Broadly, what is missing from the Bill? We heard from Unite about integrated transport, rather than this just being about the relationship between the driver and the vehicle via the insurance company, as well as some other small matters. So on the bigger issue, what do you think is missing? What would you like to see if you were the Minister in charge?

I want to ask a particular question at the end about vehicle variations. Does the Bill accommodate what we will see in the future? I believe we will see different types of vehicle variation, because there will be electric vehicles instead of just the four-seater saloon car.

**Robert Llewellyn:** There are three things that would be wonderful. I am definitely not an expert, but when you have seen this you can see how popular it is: community electric car sharing/ownership/use. When those little systems organised by local communities appear, they are very popular with the local community. I have seen this in small towns rather than big cities.

**Q78 Graham P. Jones:** Boris bikes for villages.

**Robert Llewellyn:** Almost, yes. Also, they would have a dedicated place where you would park and charge them, so you would remove that problem. There are a lot of benefits to that.

The thing I have not seen in the Bill, which is a vitally important part of this, is vehicle-to-grid technology, which is appearing rapidly. It has an enormous impact, potentially, not on vehicles but on the grid. Say there were 3 million electric cars plugged in overnight, that would be a staggering amount of electricity—a very large power station’s worth of stored energy. You only need take a small amount from each vehicle. That technology is available now, not much in this country but it is certainly being used. I have been—I am trying to keep this pithy—to an office in Tokyo that is run by 100 Nissan Leafs that are plugged in outside. They do

not use electricity from anywhere else. Those cars are discharging and charging all day, with a guaranteed amount for the owner to get home at night. So that technology already exists.

On fast charging, from my experience of driving many hundreds of thousands of miles in electric cars, slow charging is really good. Destination charging is really good. When you go to a car park and you are there for two hours topping up, it is not rapid charging, not “Gotta fill it in 10 seconds”. That, in a way, is a petrol or diesel mentality: “I’m driving a really long way. I need to fill it really fast”. You do do that, but way less than you might expect—way less. I use a rapid charger 15 or 20 times a year.

But if I can go to a car park where I can just plug the car in while I am in a meeting, or have gone to the movies or to a restaurant, and I add 20, 30 or 40 miles, that is an enormous benefit. Having more places where you can do that, more car parks with chargers fitted—that you ping your card on to pay for the electricity—would be a fantastic change. Those are emerging, and every time I can use one it is an enormous benefit. Two or three hours gives you 20 or 30 miles. You think, “That’s not very much”—well, it is 20 or 30 miles.

**The Chair:** I think we have got the message.

**Q79 Iain Stewart:** This is just a supplementary question on your earlier point about Ireland and California having a harmonised payment mechanism. Did that come about just from the industry creating it or was there Government regulation or legislation?

**Robert Llewellyn:** Absolutely from legislation, yes. The system in California, which I am more familiar with, was chaotic. I do not know quite what happened in Ireland, but it was catastrophic. It was a simple bit of Government legislation from the Californian state legislature that insisted that there was one system, that you could use all public chargers. I believe it is a dongle rather than an app. That might have changed—I have not been there for a while—but it certainly was that.

**Q80 Iain Stewart:** So that is something you would like this Bill, or another piece of legislation, to do.

**Robert Llewellyn:** That would be an amazing change, and I think it would ease in a lot of people who have not adopted electric cars: “How do I charge it?” “You just walk up there and it charges.” That would be a big change.

**Q81 Matt Western** (Warwick and Leamington) (Lab): It is great to be in the company of someone so evangelical about EVs. You have probably seen the ambition for the introduction of electric vehicles and the replacement of petrol and diesel by 2040, and an outright ban by 2050. Do you think we are being ambitious enough compared with other nations, and what it is that other nations are doing that perhaps we could learn from?

**Robert Llewellyn:** I was very pleased when I heard that announcement. Technology might overtake it. There is a strong argument for that among the evangelical electric vehicle users, from whom I try to stand one step back and be a little more objective. But it is such a hard thing to do. I have seen so many graphs to describe the uptake of new technologies and how this will be what happens with electric vehicles—the S-curve of adoption.

Our emotional relationship with cars is really complicated. It is deeper than our emotional relationship was with landline telephones or how television is viewed—all those things. It is more complex than that; I do not think it is quite as simple. I think you could be more ambitious. You could go with 2030, the technology is advancing so much.

The simple fact is that the car I have had the longest—a Nissan Leaf—has a 24kWh battery. There is now the new Nissan Leaf and the battery pack is exactly the same size and it is a 40kWh battery. That more than doubles the range of my very battered dirty old Nissan Leaf that I drove to the train station today. Sorry, no more piffle.

**Q82 Scott Mann:** I just wanted to ask briefly about your experience of driving in very rural areas. We have a lot of energy generation around the country happening in rural areas, through solar and wind. I just wanted to know whether there are enough charging points in rural areas and whether we could do something to decouple the national grid in some of those areas, so that some of the farmers producing that energy could effectively provide charging points.

**Robert Llewellyn:** There is a whole other area of fascinating stuff going on with micro-grids and local community-owned generation. That is something that I am involved with in my village. I think it is actually in many ways easier to have an electric vehicle in a rural area—I live in one—because you have generally got, even if it is a muddy drive or field entrance, somewhere you can park the car off the road. Far more people in a rural area have that ability.

You also generally have a bit more space to install solar panels or wind turbines. There is certainly a lot of that activity happening on a community level, of people generating their own power—they own the assets that do that—and they also install electric car chargers. A farmer local to me who is putting 20kW of solar on his barn roof wants to open a café with car chargers. You would have to drive miles to go there—I do not know why anyone would—though he has some nice cows.

**Q83 Matt Rodda** (Reading East) (Lab): My question is similar, but from an urban perspective. What would you see as the most effective way to encourage urban residents, particularly those who do not have off-street parking, to convert to electric vehicles? Secondly, how would you incentivise landowners who have car parks, such as large employers, railway stations and supermarkets, to have chargers?

**Robert Llewellyn:** I feel more confident in answering the second part. When people do install destination chargers—the common term for it—they all notice an increase in time spent by individual customers, because they are there a bit longer, and repeat visitors. Convincing supermarkets that, if they put chargers in their car parks, they will get more customers is the argument that I always try to use.

Certainly, hotels and restaurants have noticed a marked increase of a specific type of customer, particularly if it is a high-end electric vehicle. If they put those chargers in, they appear on the map on the satnav and they get more business like that. That is an argument. I do not know whether you could legislate for that but that is

certainly an argument in favour of doing it. As more electric vehicles appear, I feel that will kind of roll itself out in a way.

**Q84 Matt Rodda:** Do you feel there is a need to look at the way the planning system could incentivise that, to get the market started?

**Robert Llewellyn:** I would hope that there would be. It would be wonderful if there were encouragements and nudging pressure to say, “When you build this new supermarket with a car park, can you put in 40 car chargers? Not two or four down the far end but to have one whole side for electrical vehicle charging.” It is not that expensive to do low-cost top-up charges; that is not a big expense.

**Q85 Alan Brown:** Past UK Government policy led to an increase in uptake of diesel vehicles, which we now know are huge contributors to problems of air pollution. Therefore, to achieve future deadlines, would it make sense for the UK Government directly to incentivise the purchase of EVs or low-emission vehicles, through scrappage schemes and so on?

**Robert Llewellyn:** I am very uncomfortable about pressuring people in that sense. We should encourage them, certainly, but not pressure them, because of the result of the misinformation that we all suffered from. I had a diesel car, as did a lot of people. I think that is a really difficult area. I feel very unqualified to know how to do that. I work on encouragement and enthusiasm; I would not know how to instigate legislation that would insist on people buying electric cars.

**Q86 Alan Brown:** Incentivise, rather than insist.

**Robert Llewellyn:** Yes—incentivise, certainly.

**The Chair:** If there are no further questions from Members, I thank the witness for his evidence.

*Ordered,* That further consideration be now adjourned.  
—(*Andrew Stephenson.*)

11.20 am

*Adjourned till this day at Two o'clock.*

