Corrected oral evidence: Autonomous vehicles

Tuesday 22 November 2016
11.40 am

Watch the meeting

Members present: Earl of Selborne (Chairman); Lord Borwick; Lord Cameron of Dillington; Lord Hennessey of Nympsfield; Lord Hunt of Chesterton; Lord Mair; Lord Maxton; Baroness Neville-Jones; Lord Oxburgh; and Baroness Young of Old Scone.

Evidence Session No. 8 Heard in Public Questions 63 - 74

Witnesses

I: Rt Hon John Hayes CBE MP, Minister of State, Department for Transport; and Nick Hurd MP, Minister of State for Climate Change and Industry, Department for Business, Energy and Industrial Strategy.

USE OF THE TRANSCRIPT

1. This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.
Examination of witnesses

Rt Hon John Hayes CBE MP and Nick Hurd MP.

Q63 **The Chairman:** We are most grateful to you for joining us this morning. This is our last oral session of evidence in our inquiry on autonomous vehicles, for which I think we should say "connected and autonomous vehicles". We are being broadcast, so I will ask if you would like to introduce yourselves, and if you would like to make an opening statement before we go into the questions do feel free to do so. Would Mr Hayes like to start?

**John Hayes:** I am John Hayes and I am Minister of State at the Department for Transport.

**Nick Hurd:** I am Nick Hurd and I am Minister of State at the Department for Business, Energy and Industrial Strategy.

**The Chairman:** You do not want to make an opening statement?

**John Hayes:** I would be delighted to do so.

**The Chairman:** I am giving you the choice.

**John Hayes:** Schumacher said in his seminal book *Small Is Beautiful* that "the system of nature of which man is a part tends to be self-balancing, self-adjusting, self-cleansing; not so with technology". There are two things I will say at the outset.

There is a kind of Whiggish assumption that all change means progress, which I completely refute. Of course, the truth is that in each and in all of our lives many things change, some for the better and some for the worse. Part of the job of Government is to try to anticipate those changes and the effect they might have on communal well-being, personal opportunity and fulfilment.

The second is that, sadly, in that spirit and context, governments are notoriously bad at thinking both laterally and long term. This is not a reflection on this Government or the previous one, it is a comment on governments generally. This is for two reasons, in essence, Chairman, as you know. First, to think laterally requires them spanning all kinds of responsibilities and departments and ministers’ work, and to think long-term in a democratic polity means freeing oneself from the inevitable consideration of the five-year electoral cycle. To predict and think long-term is risky for government, risky for the officials who advise ministers and risky for ministers themselves.

Bearing in mind my two hypotheses, where does that leave us in respect of autonomous vehicles? We have to do, it seems to me, two fundamental things. The first is to try to establish a regulatory framework sufficient to allow us to take advantage of the opportunities these vehicles offer whilst not assuming that those who develop the technology and those who market it will be motivated in the first instance by virtue. When I was a businessman, I was interested in the commercial success of my business and nothing much more than that. We should not expect, and it is not reasonable to expect, the technologists and the businesses associated with this to take that bigger, societal, communal view.
The second is that we need to measure across government what the consequences and ramifications of these changes might mean. They have implications for all kinds of things, as your inquiry has no doubt already identified, Chairman, in all kinds of aspects of government: employment, urban planning, the very concept of ownership, accessibility, safety, and so forth. They cross a series of ministerial portfolios and touch on a series of departmental areas of concern. I am mindful that your inquiry will be exploring all those things, but it is important that this important Committee knows that we understand those things too. This is not a straightforward matter, Chairman, and no one would pretend it is, but we are determined to try to think, as much as governments ever do, widely and in the long term.

The Chairman: Thank you very much.

Nick Hurd: Chairman, could I complement that, and I will be considerably more prosaic and much less interesting than my friend John?

I represent the Department for Business, Energy and Industrial Strategy, so our primary interest is in the industrial opportunity that, in theory, underpins this area. We are delighted by the interest of the Committee in it, but obviously the immediate context is our preparation of an industrial strategy. The primary driver of that is tackling the imbalances of prosperity and productivity across the country and getting a clearer view on where the decent jobs and decent wages will come from in the future.

Part of the reason why a strategy is required is that it is very clear that many key sectors of our economy face huge levels of change and, arguably, none more so than the auto sector, which is very important to the economy. That is why we have been very keen for some time to try to position the UK as a go-to destination for the research and testing of connected and autonomous vehicles because we are clear that, in theory, there exists a substantial industrial opportunity for the UK going forward, so we have set up what seems to be a competitive stall in terms of research and development, the regulatory environment and the testing environment. I would expect this to be an important feature of the industrial strategy going forward in the context of the future of the auto sector and the very fundamental discussion about the future of mobility.

The Chairman: Thank you very much.

Lord Hennessy of Nympsfield: I really appreciated the width of your opening statement; I found it very interesting. I note that you stress that it is a very risky thing for any government to think long-term, but can I ask you, therefore, to take a bit of a risk, to take a walk on the wild side and start us off, Mr Hurd too, with a bit of horizon-scanning. What do you think are the risks and the drawbacks in the assessment you can already make from what you know of this move to autonomous vehicles and other sectors of the economy which will be automated? Can you take a very non-Whiggish, practical view of the social and human aspects of all this, because I am one of those people who thinks we will have to change human nature if this is going to work, a bit of a sceptic? With all those caveats in mind, which you
have expressed so eloquently, take a walk on the wild side into the future. Have you seen the future and is it going to work?

*John Hayes:* Like Lou Reed?

*Lord Hennessy of Nympsfield:* Exactly.

*John Hayes:* I have written to the chief scientist today to support a piece of work that my officials have already been persuading him to take on the future of mobility generally, because you have to put this in that context. This is about the future of mobility, about, in a sense, why people travel, where they travel and how they travel. Whilst it is important to be specific about autonomous vehicles, and I will be in a second, it is important also to understand what you have implied, that there is a very significant, bigger thing happening in respect of technological change which challenges some of our core assumptions about why, where and how people travel. I am hoping that we will get that piece of foresight work of the depth and character that you wish and I wish too.

*Lord Hennessy of Nympsfield:* Can you make sure the Committee gets sight of that?

*John Hayes:* I will give the Committee sight of my letter. Assuming we are successful in getting the chief scientist to agree to engage in this work, clearly it will be very important that the Committee gets, at the earliest opportunity, the modus operandi of that, the terms of reference of the work that I am describing, so I am happy to provide that, of course.

The second thing is on the specifics. We have already engaged in pieces of scoping work to look at a range of issues. One is around insurance, and of course we have the modern transport Bill, which will be published next year, which is an opportunity to give some of that statutory life, so insurance is important, and liability. It changes, of course, a lot of what we currently know about liability, so the insurance aspects of this are important. Clearly, the safety aspects are very important. This could provide a significant advantage in terms of safety and could make driving safer, providing we do the diligence in respect of the technology itself and that the technology is sound, because it will eliminate human error; human error is the principal cause of most road traffic accidents, of course.

Third, I think it might be beneficial in respect of accessibility. There are all kinds of people who do not drive because they cannot drive, which might be due to infirmity, disability, age, et cetera, and those people might now be able to have access to travel which they do not have currently, so there is a significant societal implication.

Finally, and I could go on and on, Chairman, on the positives, it may lead to more car-sharing and a different perspective on the ownership of vehicles. Essentially, people will acquire a car when they need it, rather like they might book a taxi now when they need it, rather than having a car sitting in the drive for long periods of time or sitting in a car park for a very long period of time, so that could be beneficial in terms of the numbers of cars on the road with the knock-on effect on congestion, emissions and so on. Those are some of the ups.
On some of the downs, let me just flirt with those for a moment rather more briefly. I think the principal down is in my opening remarks in assuming that somehow the market will regulate this and that it will all work out okay in the end. If we were to go down that road and assume that somehow this technology will regulate itself and will all work out okay, without doing all the diligence on some of the things I have described, we might find ourselves in very deep waters. Part of the downside is in not identifying and qualifying the potential of the upsides.

Lord Hennessy of Nympsfield: Does Mr Hurd have a vision?

Nick Hurd: My powers of imagination are significantly more limited than my friend’s, but I am the Minister for Climate Change as well as industry, so what I can see is that what we drive will change profoundly over the next 10 years, both in terms of not just the carbon imperative but the clean air imperative as well; that is clear to me.

I can see how the technology in-car is changing so fast that the efficiency with which we drive will be evolutionary and, I think, radical. Whether that leads us to a future where we do not drive I am not sure, but it is clear that clear thinkers and leaders in the auto sector think that is the future.

What is clear to me is that our attitude towards the car is changing. I have six children, four of whom are of the age when they could drive, but only one does. Their attitude to car ownership is completely different from mine when I was growing up, so there is profound change going on inside the sector which matters a great deal to our industry, and I come back to that point.

The Government have to be alive to the industrial opportunity that underpins this, and clever people have produced, inevitably, reports that go with every transformative technology pointing to billions of pounds of upside and hundreds of thousands of jobs. Who knows, but there clearly is the potential for a big industrial opportunity and, therefore, the Government have to be alive to it and on it.

Q65 The Chairman: I want to move on to the problems of operating a mixed fleet. It is clear that there is a role for fully automated transport systems. We know they are already in mind. For example, in Western Australia, there are fully automated vehicles running, there is the London Docklands Light Railway, a different kind of transport system; forklift trucks, farm machines, all these fully automated with no great problem, I suspect, in advancing them safely. When it comes to operating a mixed fleet on our existing roads, it is very different. What research have you done on the practical issues of managing a mixed fleet on the UK networks?

John Hayes: There are several things. The first is that we have developed a code of practice which sets out simple recommendations for how we test these vehicles anywhere in the UK. For example, in Western Australia, there are fully automated vehicles running, there is the London Docklands Light Railway, a different kind of transport system; forklift trucks, farm machines, all these fully automated with no great problem, I suspect, in advancing them safely. When it comes to operating a mixed fleet on our existing roads, it is very different. What research have you done on the practical issues of managing a mixed fleet on the UK networks?

John Hayes: There are several things. The first is that we have developed a code of practice which sets out simple recommendations for how we test these vehicles anywhere in the UK. As well as some of the things I have described, roadworthiness, insurance and the ability of someone to take over, should they need to do so, but not necessarily in the car, part of that will, of course, be the interface between these vehicles and other vehicles in the mixed way you describe. We are ahead of our competitors, by the way, as Nick will know, in these terms.
The second, of course, is that, because we are keen to test these things in the real world, we are working, as you will also know, with four projects in four cities across the country—Milton Keynes, Coventry, Greenwich and Bristol—and there will be further projects. The Government have funded this, as you know. We are looking here, in part, to develop and demonstrate a highly autonomous vehicle in a mix of challenging environments. The purpose of that is to look at real road experience, part of which is how these vehicles fit into an existing driving landscape, which is precisely what your question is about. There is a challenge here in supporting the R&D, which we are clearly doing, which is designed to make sure the innovation happens here, and then in getting the rollout into real places where we can test these vehicles on the road. Both matter and the Government are backing both.

The Chairman: In your written evidence, which the two departments kindly submitted, you gave us a chart which shows our relative capacity in rolling out intelligent mobility. We are doing pretty well on that and are ahead of the game in, I think, eight, average in three and we are below on sensing capability, traveller behaviour and psychology, and data visualisation. If we are to lead the world in intelligent mobility, as is the Government’s intention, will we try to catch up in these areas where we are behind the curve?

John Hayes: Yes. The departments have a three-year project to try to draw together and identify key questions about behavioural change, and public engagement is a critical part of ensuring that we do catch up in those terms. As I described, the human interface for this changing technology is critically important not only to its acceptance but to the effect it has on societal change, well-being and the other things I described at the outset. Yes, we are determined to catch up by engaging the public in a formal way.

Q66 Lord Mair: Mr Hayes, I want to ask you a bit more about how connected and autonomous vehicles will fit in with the transport strategy. You spoke earlier about future personal mobility and the big advantages it, potentially, will have. Is there a possible problem with that increased convenience and personal mobility that will be available in that it might lead to an increase in journeys by car and possibly less walking, less cycling and less use of public transport? Will that, conceivably, lead to increased congestion?

John Hayes: That is an interesting question and one I posed in the department myself, by the way, because, if I am right that this could lead to more vehicle-sharing, a different perception of ownership, whether to own a vehicle or simply use a vehicle when required, that could have a net effect of the opposite kind, reduce the number of cars on the road and reduce the number of journeys. However, there is a simultaneous effect of the kind that I mentioned and you have amplified, that it will bring other people on to the road who are not there now or may bring them from one vehicle to another vehicle, so from a bus to a car or from a tram to a car and so on. I have asked the question, and this will form part of the modelling we do, which will be partly in the research we do and partly in research that we commission, as I mentioned earlier: how do we calculate what the likely effects of those two simultaneous and contradictory changes might be?
In addition, it is important, as implied by you and the Chairman, that we are mindful of our policy on buses, trains, taxis and trams accordingly because, if we were not to take into account the effect that it all might have in some of the orthodox assumptions about the use of those vehicles, we would be falling into precisely the trap that I outlined at the outset of thinking in a silo. It is really important that we do not hurtle in one direction with our public transport policy only to be hurtling in a different one with autonomous vehicles, so I entirely agree that this has to be thought of in a holistic way.

Lord Mair: Do you think the department will have to have quite strict policies to influence the directions that society might go in? This is already all about people’s adoption of autonomous vehicles, so will the Department for Transport have to have a policy to try to influence that, do you think?

John Hayes: You will know that your House of Commons equivalent Select Committee, or not quite equivalent because that would be the Transport Committee, but a Select Committee in the House of Commons on this very subject of motoring in the future, in its eighth report in the session 2014-15, said: “Witnesses to our inquiry ... highlighted the need for strategic leadership by central Government to shape the outcomes that could be delivered by new motoring technology”. It is precisely that kind of strategic approach of the kind you now recommend that the department will have to take. To be frank, I think that will need to be informed by an empiricism that might well best be gleaned from the kind of scientific and independent work that I described earlier. We will want to do this in the department and we will base those policy assumptions on a very good evidential understanding which can come from commissioning the sort of work that I mentioned.

Baroness Neville-Jones: I am going to pursue the word you just used, Mr Hayes, the word “strategic”. I entirely agree with what you have just said. You mentioned that we need to think long-term, and that is also extremely welcome. It seems to me that the Government need not only to think long-term but to help set frameworks long-term and lead long-term. I really want to explore with you the sorts of mechanisms. It has been well said and understood that what we are talking about here has huge implications right across many sectors. For instance, can you get these vehicles on the road without having sufficient 4G? What is the role of DCMS in this and is it involved? More than a year ago, when Greg Clark was still the Universities Minister, he said, “We need to set up, and we will set up, a leadership council for robotics and artificial intelligence”. That seemed to us to be a very good idea when he gave evidence to that effect, but it has not happened. In the light of what you have just been saying, do you have any comment on that, whether there is an intention to do it and the extent to which the Government should be in the van of trying to shape progress in this area?

John Hayes: It is interesting that you obviously were, as I was, studying the House of Commons Science and Technology Committee, your exact parallel committee, and their report on precisely the subject you describe to which evidence was given of the kind you have highlighted. One of the elements of that report suggested that
“appropriate legal and regulatory frameworks will need to be developed to support
the widespread deployment of robots and, in particular, autonomous systems”,
exactly as you describe. I think, if I might say so, that you are right—we do need to
do extra work across government in this respect. I will study what Greg Clark said at
that time, because I do not have that in front of me, and look at whether we have
done enough to follow it through and, frankly, if we have not, we will.

Baroness Neville-Jones: I think part of the implication of what he was saying was
that it is not only, and I entirely agree, that the Government need to have an all-
government approach, which I think is easily understood, but you also in this area, it
seems to me, need to have a partnership with business, so you have several
elements that need to come together in order to give the leadership that is really
needed.

John Hayes: Yes. The engagement with business is undoubtedly there. My officials
are in extremely regular communication with the people who are developing this
technology and I was with the motor manufacturers yesterday when we were
discussing this subject, as you might imagine, so both Ministers and officials are in
regular communication. I wonder, given what you have said and what I have been
reading in preparation for this meeting, whether we might formalise that a bit
more. There are all kinds of committees that sit, and I do not need to bore you with
the details of them, and those are part-driven by BEIS, as you know, which I have
also been a Minister in, and other organisations. It might be that we need to
formalise that and I am very happy to go away and think about that and, having
done so, write to this Committee promptly. I want to look at what Greg said and at
what we are already doing, if I might say so, but I do not rule anything out. I think
you are right, that the better that we can communicate, the better we might be
able to anticipate the change.

Nick Hurd: If I could just complement that: your point is very well made. Clearly, this
is an area that requires a strategic approach because there are different dimensions
to it, but that is exactly the approach we are taking through the industrial strategy,
which is cross-government, and will have, inevitably, a sector focus, but in a
different way from before. We will be saying to sectors, of which the connected and
autonomous sector will be a very valid example, “There is clearly a big economic
opportunity here. What do we need to do together to make sure that we remain
competitive in this area and, through the industrial strategy process, how can we
move from A to B on a cross-government approach so that we can bring in the other
departments?”

The Automotive Council, which has been enormously successful and fundamental to
the regeneration of the auto industry since the financial crisis, is a very good
example of where these councils can add a tremendous amount of value. To the
Robotics and Autonomous Systems Leadership Council, you are quite right: my boss,
Greg Clark, did make statements of intent before and we fully intend to revisit that
in the conversation with the sector through the process of the industrial strategy.
We just feel that we need to refresh that conversation through that process to
check whether that is still the right idea and still adds most value. Our instinct is probably yes, but we just need to refresh it.

**Baroness Neville-Jones:** I think that some visibility given to the notion of leadership of the kind we have been discussing would be very helpful in pushing things on.

**Nick Hurd:** I could not agree more.

**Q68 Baroness Young of Old Scone:** Could we take the strategic approach slightly further? In your department’s evidence the dilemma was outlined of whether this is going to primarily be about automated vehicles or a much bigger systems issue where we are talking about interconnected transport, communications and road structures, which is bigger than all of us, a very big task and probably a task that needs to be grappled with now if we are not going to have inappropriate structures, processes and road systems for the future. Where is the Government on that bigger whole-systems approach?

**Nick Hurd:** I think what is important here is that no one quite knows how this is going to play out. What is key, to my eyes and the focus of our strategy as a department, is to try to make sure that the research, so the demonstration, the testing, the thinking and, therefore, the potential IP, is being developed in this country so that we have, if you like, the best possible view on what the future might hold because the people thinking the future are here. I think that is the first step. Again, in the very practical world that I live in, my first question is: what can we do to make sure that the thinkers, the people who are going to shape this future, are operating in the UK? That is why we have set out the stall we have done in R&D, regulation and the testing ecosystem, and it does appear to be highly competitive.

**John Hayes:** I mentioned the scoping study we have done on behavioural changes, which we commissioned in February 2016, and that will report in the new year. You are right too, as was touched on in your question about mixed fleets, that there is a separate piece of work to be done. We have commissioned new research using microsimulation modelling techniques to investigate the potential large-scale impact of connected and autonomous vehicles on traffic flow, network performance, urban roads, interurban roads, and so on. Part of this, of course, is about tying the changes in the technology in vehicles with the changes in the way information is provided in real time in the vehicle and on the road itself. You will be aware that we have developed over time our smart motorway concept where we can provide much more information to drivers as they go about their business. The relationship between that technology, the communications technology that you mentioned, and the technology in the vehicle itself is very important, which is why we have commissioned further research to look at that.

**Lord Maxton:** You have, quite rightly, Mr Hayes, and less so Mr Hurd perhaps, talked about the communication between you, your staff and manufacturers, and then you say that we want to keep it in this country. Most of the manufacturers, however, are not in this country, so how do you communicate with the manufacturers if they are not in this country but elsewhere and they are doing the research?
**Nick Hurd:** There is a lot of research being done in this country, in large part because of the Government’s support for it, so I dispute the premise and the premise that the auto manufacturers are not in this country; they are in a very big way. In fact, recently we have succeeded in persuading one of the biggest to double-down, if you like, in their investment in the country.

**Lord Maxton:** What percentage of vehicles driven on the roads in this country are manufactured in this country?

**Nick Hurd:** We are one of the biggest car markets in Europe and one of the biggest producers of cars in Europe. Frankly, it has been one of our great industrial success stories since the 1980s and since the financial crisis of 2008. I am surprised at the premise because I think it is generally recognised, in terms of the auto sector in the UK, that the UK is extremely competitive and a magnet for those who want to work with our scientists, researchers and engineers.

**Q69 Lord Hunt of Chesterton:** I noticed your comment, Mr Hurd, that this whole question of automation of cars is a big international process. We have universal road signs and, presumably, one day we will have universal systems of automation. In the way you were describing it, we are doing clever things in Britain and the industry comes here. We heard this morning from somebody on a panel in the United States, Japan and Europe. This is such an important revolution. Is this not as big a change as the rules for aviation or the rules for climate change? What is the Government’s approach to ensure that this technology is efficiently introduced around the world, considering that there has been no mention of that in what we have heard so far? We understand that we are, for example, very strong in this meeting in Geneva, but I wonder whether you would like to expand on that, as it were.

**Nick Hurd:** John will come in on this, but obviously the issue of standards is absolutely critical, as is the harmonisation of those. I think you have heard in previous sessions, and you referred to it, Lord Hunt, that the UK is not just at the table in those conversations in Geneva but chairing some of the most important committees. We are clearly in a position to influence those critical conversations.

The point about the global movement of course is right, and I understand where Lord Maxton was coming from on that. It is clear that we have some competitive advantage, and the capability study demonstrated at least eight areas where we are ahead in the world. The challenge for us going forward through the industrial strategy is where we can retain competitive advantage. We are not going to lead in everything, that is clear, so where do we plant the British flags in terms of the key capabilities? I think that is part of the strategic approach that we have to take and part of the dialogue between governments and industry.

**John Hayes:** It is partly the Government de-risking some of the most risky business aspects of this because, of course, when you are at the cutting edge in business you are, by nature, at the riskiest end of a developing market, so we can de-risk that partly by the financial support we get, which is why we have developed the £19 million for the four cities and the £100 million Intelligent Mobility Fund, which is
about trying to ensure that we guide and shape how these things develop. As Nick implied, and I have already mentioned, on the code of practice and the regulatory framework that we need to put in place to make sure it is as good as anywhere in the world, and I think it can be, we are already ahead, as you know; the Lord Chairman highlighted it and it is detailed in my written evidence. We are already ahead in areas such as human-machine interfaces, real-time control, simulation, data privacy, cyber security, and so on. There are eight areas altogether, but I will not go into them tediously as you have them in writing. We have a lot of scientific advantage already here and, if we can get the behavioural stuff sorted out in the way that we are trying to, and if we can get the regulatory framework as good as it can be, I think we can be genuinely world-beating. It is challenging, but the fact that we are already taking this action and doing this work puts us in a good place.

**Lord Hunt of Chesterton:** If you drive, as I did last weekend, from London to Bristol, many of the cars are German cars and the percentage is very high. How will we ensure that the companies, which may be manufacturing in Britain but are owned and their strategy is back in their home country, use this clever stuff that we are doing in the UK? That is a problem, and I am surprised that you regard it as not a problem.

**Nick Hurd:** I certainly did not say it was not a problem. It is clearly a challenge, but we have set out a stall that people tell us is competitive. People are coming here to think this through and to take advantage of the research and innovation offer, to work with our universities and with all the brains in this country and to take advantage of the regulatory and testing system that we have set up, which seems to be extremely competitive, but I do not think John and I have given any impression that we are complacent about this at all; this is going to be very competitive.

**John Hayes:** I think your helpfully provocative question, if I might say so, does oblige the consideration of the value chain. There is a perfectly proper piece, as you implied, of value chain analysis to be done where we identify those areas where we can be genuinely world-beating and where there is higher value for our economy and our businesses and those areas where we are likely to be in a highly competitive situation and may well be out-priced or under-priced. Realistically, I think we should build on our strengths and make sure we cement those strengths in the ways I described a few moments ago, and there are things the Government can do—pump-prime, support, take risk out, et cetera—rather than pretend that we will be able to be in every place and be world-beating in every area. I do not think that is sensible or realistic because, fundamentally, I do not think it is true.

**Lord Hennessy of Nympsfield:** Can I just follow up something Nick Hurd said about the industrial strategy? It has been the ghost in this inquiry, shimmering through almost every bit of evidence we are getting, yet we have not had the flesh. I was hoping that we were going to get the Green Paper tomorrow, and I do not know if we will or not, on the industrial strategy. There are two things really. Nick Hurd had this interesting phrase, that the industrial strategy is about where we plant our UK flags, which sounds to me suspiciously like picking winners under a different nomenclature, but that is another question. How will having an industrial strategy,
which I am very keen on and very supportive of, increase the chances of our getting
this transformation that we are contemplating right? Where will it really add the
value that we have not got at the moment because we do not have an industrial
strategy?

Nick Hurd: Thank you for your welcome of the industrial strategy. For clarification,
my flag-planting metaphor was strictly in the context of the capabilities within the
connected and autonomous sector, but I think it probably translates across to other
areas where we have to be very smart in identifying where we have strengths to
build on and where we can reinforce great or maybe move from good to great. That
is a fundamental part of the process, to reinforce our competitiveness. On the
industrial strategy, to be fair, it is a relatively new Government and it is a very big
undertaking, so it cannot be rushed and it is evolving.

Lord Hennessy of Nympsfield: So we are not getting it tomorrow?

Nick Hurd: I am not going to prejudge what the Chancellor says in his Autumn
Statement because that would have career consequences that are unthinkable. You
have had a clear steer from the Prime Minister about the weight that will be
attached to science research and innovation, and I hope that is welcomed by this
Committee. I do not know what Philip will say tomorrow, but he has clearly been
very articulate about the need for high-value infrastructure. We will follow shortly
after with the first output of the industrial strategy process, which will set a
framework and then pose some questions. We are very clear that this is a process
on which we need to engage quite fully not just with sectors but with localities and
with different sectors of society because this is a very big undertaking. It is a
different process from the ones we have seen before where perhaps the
Department for Business, Energy and Industrial Strategy has picked some sectors or
technologies to get by. This is a bigger enterprise that it is trying to address, a very
big structural challenge which is, to use the political strapline: how do we make this
economy work for more people, how do we create a broader sense of opportunity
and how do we tackle the imbalances in terms of prosperity and productivity? It is a
very serious undertaking, which is why the Prime Minister placed such emphasis on
it.

Lord Hennessy of Nympsfield: It will help in this area, you think?

Nick Hurd: Yes, I think this is a very good example of a modern sector approach,
which will not be the Government saying, “These are the sectors that we choose”. I
think the process will be more that sectors come to us and say, “Let’s talk about the
opportunities and let’s talk about some of the barriers and let’s see what we can do
together to help unlock the potential in this sector”, if we believe in it. So there will
be a challenge to the connected and autonomous sector to work through the
industrial strategy with my department to see what more we can do to unlock the
potential in this area.

Q71 Lord Cameron of Dillington: I tend to speak on rural issues in this House and, being
a glass half full sort of person, I think there is great potential in this at a time, for
instance, when we have just heard that rural public transport has dropped by 11%
in recent times. I think it will probably start with automated systems between, say, park-and-rides and city centres where there will be automated mechanisms within the transport, and perhaps along the route, helping the bus so that it will be driverless and then, hopefully, that will develop into standardised bus routes along the same mechanisms so that you get cheap to run, driverless mobility pods, as we have learnt to call them, and we will get more public transport in rural areas. The Government’s role here must be to take the local transport authorities along with it, and I was wondering what you were doing about that. We heard from the local transport authorities that they want the Government to convene fora that will allow local bodies to share knowledge and expertise, and I was wondering whether you had already kick-started that process.

**John Hayes:** We have funded, as you will know from what you have looked at already, the Technology Transport Forum, which is working with local authorities to look at precisely the issues you describe. We set it up, in essence, to join the technologies together and to explore some of the things we have spoken about already this morning: the way that the technology will work in all kinds of different places with different road networks, the way that it will affect the development of communities and so on and so forth. That forum will be the guide to set out what autonomous vehicles can do for different localities and how local authorities can play their part in this.

We started here talking about the potential advantages and disadvantages of this technology. I like to be very frank with committees like this as it is the right thing to do, and I was discussing with my officials this morning the risk that rural areas might get left out because they are already less well connected in all kinds of ways, not least, as per the question earlier, through the paucity of some of their internet connectivity. If you have poor broadband, poor mobile phone coverage and the inability to communicate already, if autonomous vehicles will interface with those other technologies and those other technologies are not in place, where does that leave an area that is already isolated but potentially more isolated? I am very determined to make sure that does not happen by the steps the Government can take. As part of this work with local authorities, it may well be that we need to look at some particular work in those most rural communities where, potentially, this change could have the greatest benefit. If I am right about the kinds of people who are currently unable to travel because they do not have access to transport, and I mentioned visually impaired people, elderly people and so on, that is just as true for people who are rurally isolated in the way that you understand.

What I will do, and I will drop a line to the Committee about this, if I may, Chairman, is ask my officials, following the meeting I had earlier and the question you have just posed, to look at whether we need to supplement that piece of work I have described with an additional set of requirements or suggestions around rurality. I am of the same mind as you.

**Q72 The Chairman:** If we can move on to regulation, clearly regulation is the role of the Government and Parliament. Much of what we have been discussing up to now of the responsibilities will be shared with the sector as the technology advances.
Regulation will need to change, and I know that the Government’s intention is to keep regulatory reform under constant review. We have to think about insurance liability, technical standards, data ownership and much else and, presumably, the modern transport Bill will deal with much of this. Could you tell us how you are able to track the regulatory reform which will be necessary? I would just quote some written evidence we have had from Kennedy’s, a law firm, who say: “We urge the Government to create an industry-wide group that would advise ministers and civil servants on how the technology is developing to inform their thinking on how regulation needs to change with it. One of the main objectives of such a group should be to reach a consensus on what types of vehicles are likely to arrive on the UK market over, say, the next 10 years. This would greatly assist the Government with regulatory planning”. I wonder if you would like to comment on that.

John Hayes: I mentioned earlier, Chairman, the modern transport Bill, which we will publish early next year. It was announced in the Queen’s Speech, as you know, unexpectedly. That will be an opportunity for us to look at precisely the issues you have described and it will be framed on the basis of many of the kinds of discussions you have described. I mentioned earlier the issue of insurance and liability. It is vitally important, if this technology is to have the effect we hope for, that we get the regulatory environment right for consumers and insurers. The insurers, the consumers and the manufacturers all have to sign up to a very different regime where, essentially, we challenge some of the existing assumptions about liability. The modern transport Bill will address that.

Also, looking at fundamental questions about how robust the technology is, the roadworthiness of what emerges and how that is subsequently regulated, the difficulty is of course that, because we are in a highly dynamic set of circumstances in relation to the technology itself, we need to be flexible enough to make sure that we can regulate as we go on, so it will necessitate the Government taking some powers to take further steps down the line as we know more of the questions that the technology implicitly poses. Again, in the Bill, the Secretary of State will take those powers and I will be arguing that case on his behalf. You are right, Chairman, that getting this established early is important, which is why that Bill is important.

Q73 Baroness Young of Old Scone: Could I raise one issue that was in your evidence, which is about the potential impact on employment for the future? Who knows what has been happening globally in the last few months, but it appears that people in lower-skilled jobs are feeling very dispossessed by globalisation and the way things are going. Are the Government thinking about the potential impact on many lower-skilled jobs in the driving professions and current transport arrangements, compared with a generation of a range of high-tech jobs in systems development, communications and automated vehicles, and the impact that could have on employment in this country not just in gross terms but in the nature of the employment and, therefore, whether we are in danger of creating more dispossessed people?

Nick Hurd: I think this is a really important point and it is part of our need to understand the balance of risk and opportunity behind some of this, to use the
jargon, disruptive technology. As John and Committee Members have articulated, there is a whole range of potential benefits, but there are some downsides as well that we need to understand. I come back to what has been described as the ghost in the room, which is the process around the industrial strategy. It is to take stock at this moment in time, which is a genuinely pivotal moment in time not just because of Brexit but because of the big structural changes that so many sectors of the economy now face, so that we really understand the balance of risk and opportunity for the UK and, therefore, the strategies that we develop with the sectors reflect that balance of risk and opportunity.

In the auto sector, our priority is to make sure that we remain fully competitive in this country so that the big manufacturers continue to want to make cars here and develop their thinking about the future, whether it be on electric cars, ultralow emission cars or, what we are discussing today, the connected and autonomous. The key thing is to try to keep them here, which is why we place such an emphasis on retaining the competitiveness of the auto sector.

My final point is that all the research and development goes around that. We do need to be asking these questions about rebound effects and what the consequences are because the fundamental question that the industrial strategy asks is: where are the decent jobs going to be in the future and how do we shape our economy to respond to the trends that are buffeting every country at this moment in time? That partly reinforces the need for an industrial strategy at this point.

John Hayes: I would refer again to this report that I mentioned earlier, the House of Commons Science and Technology Committee Report on Robotics and Artificial Intelligence, Chairman, where this very issue was debated at considerable length. The way in which it was debated was to explore the issue of job augmentation. Of course, the evidence that was given to that Committee from a variety of sources, some predictable, such as Microsoft’s, but not without value, was that, far from destroying jobs, autonomous and robotic technologies had simply changed the things people did in work. I suppose you would have to say that, if one took a broader view, the evidence is here to see. Deloitte’s argue that we often think of this as humans versus machines or robots and, in fact, it is much subtler than that and is about providing support for tasks within jobs. It went on to say, “It did not destroy my industry. In fact, my industry is much larger”. Similarly, the Royal Society’s Machine Learning Working Group said, “Technology has been an augmenter of many professional and white collar activities”. In net terms, I am not so sure that we will see employment reduce as a result of this, but we may well see change.

Now, to be subtler than those witnesses or, dare I say, to be subtler still than those witnesses, I do think there are two concerns about that. One is that, if that change happens quickly, the readjustment would be significant and require a similarly significant reinvestment in skills, skills training and education, so there are big implications there. The second, and perhaps more provocatively still, is that there is this issue about how we perceive work and the working class. It has been, sadly,
rather fashionable for some time in this country to pretend that work and the working class were somehow something either to ignore or, possibly, even to disparage. As someone who is proud to come from a working-class background, I rather like workers and work.

**Nick Hurd:** Chairman, John has triggered a recollection in my mind that a Member of your Committee, Viscount Ridley, wrote very powerfully on this in *The Times* yesterday.

**The Chairman:** He has sent his apologies.

**Nick Hurd:** He made this point and put it in a historical perspective which is that, over our history of progress as a country, there have always been concerns about the impact of automation and progress on jobs and, historically, they have been overstated and what we have engineered are shifts. The point I was trying to make is that I hope, and I do not want to overstate it, through the process of taking a more strategic approach, we could perhaps be more proactive than we have been in the past in terms of preparing for change.

**John Hayes:** I guess the industrial revolution did not do much for the ostlers and farriers, did it?

**Baroness Neville-Jones:** I wanted to ask you a bit more, if you can tell us, about the likely approach that will be adopted in the modern transport Bill. Will it contain a vision of where the Government see the transport and infrastructure and the future mobility plan for this country going? Within that, given that, it seems to me, there are an awful lot of questions to which we do not yet know the answers about how we get from A to B, will it set up structures of a kind which enable us to answer some of these questions? Will the Government be taking a leadership role in helping to bring together people’s points of view, both from the Government and the private sector, and being able then to push forward the progress in the various sectors that go to make up a national transport infrastructure?

**John Hayes:** Having earlier commended my frankness, I had better live up to the rhetoric now and say that the Bill will, to some extent, do that inasmuch as I think it reasonably can at this juncture. Based on the work we have already done, the research we have commissioned and the extensive discussions we have had with the industries, insurance, the manufacturers, the technologists and those involved with the R&D, there are things that we can do structurally, but, as I suggested earlier, some of it will be taking powers to do things later, which, as you know, neither House ever likes that much.

**Baroness Neville-Jones:** They do not like future-proofing, it is true.

**John Hayes:** The very flexibility it gives the Government also makes legislators nervous, but in this area, if any, there is an absolute justification for us being frank and saying that we do not quite know what the circumstances will be five or 10 years down the line and we cannot simply keep legislating on a routine basis. Yes, we will, where we can, make the structural changes you describe and certainly
sufficient to do what we have to and not to inhibit further development, but we may also need to be honest about the dynamism that you and I both recognise.

**The Chairman:** I think we have come to the end of the session. I suspect we could have continued rather longer, but we must not detain you any longer. Mr Hayes, you mentioned two research studies in the department, scoping for a bigger study of behaviour and microsimulation of mixed fleets, and indeed there may be other projects under way. If you could send us a note on those, that would be very helpful.

**John Hayes:** Chairman, I was going to suggest before you asked that I ask my officials to brief the Committee, if you are happy for them to do that, on both of those studies.

**The Chairman:** Thank you very much. I can assure Mr Hurd that the Committee welcomes without reservation the Prime Minister’s statement to the CBI yesterday and we will take the opportunity, when we complete our report on the follow-up on EU science and Brexit, to give some, I hope, very positive observations on that development. To both Ministers, Mr Hayes and Mr Hurd, thank you very much for rounding up our oral inquiry sessions.