





# Managing the politics of progress

**Lilian Greenwood MP, chair of the transport select committee, explains the challenges that need to be overcome in order to deliver safe and sustainable driverless cars**



**A**s I write this piece, it's being reported that a driverless shuttle bus in Las Vegas has had an accident on its first day of operation. The headlines give the impression this self-driving bus crashed; when you read the story it's clear a conventional lorry ran into it. Perhaps a headline that says "Self-driving bus stopped as intended but human lorry driver didn't" is a little less gripping. And perhaps the reporting indicates a hesitance to trust driverless vehicles.

Autonomous vehicles promise a range of social and economic benefits from improved road safety to greater mobility and independence for people who cannot drive. Platooning of vehicles and better management of traffic flows might mean we can squeeze more capacity out of existing infrastructure. But such benefits can only be realised once some significant challenges are overcome.

The most difficult challenges are unlikely to be technical. They will more likely be political, regulatory or rooted in issues of public acceptance. The politics of agreeing the international and national technological standards needed to support the widespread deployment of higher-level connected and autonomous vehicle technologies could be fraught. We already see widely differing political standpoints across the United States, with Uber's autonomous vehicles forced out of California to set up in more welcoming Arizona, for example.

Creating the right regulatory frameworks will be another major challenge. Some of this will be relatively easy; there are existing standards and

frameworks to build on and institutions to lead the work. In other emerging areas, such as vehicle-to-vehicle or vehicle-to-infrastructure communication, it is potentially more difficult. The government is trying to ensure that the United Kingdom is well positioned to benefit from the growing market in connected and autonomous vehicles. It published a Code of Practice for testing autonomous vehicles in July 2015 and three trials are underway in the UK. It consulted on its broader regulatory approach in July 2016 and, in October 2017, introduced the Automated and Electric Vehicles Bill to "set the regulatory framework to enable the next wave of transport technology to be designed, made and used in the UK."

Public acceptance is perhaps the most difficult challenge. While many cars already have autonomous features like emergency braking, lane guidance systems or parking assistance, we are still some way off fully autonomous vehicles navigating complex cityscapes. It will take time to reach the point where a parent is willing to consign their child to a self-driving car on the school run.

Public acceptance depends to a large degree on perceptions of safety. Nothing can be completely safe; just as human drivers have limitations, so too does technology. We know that currently somewhere between 75 per cent and 95 per cent of vehicle collisions are caused by human error; the potential safety gains from the technology taking control are huge. But if public acceptance is to be achieved, it is vital that any claims to improved safety are thoroughly evidenced by motor manufacturers, trust in whom is low after the Volkswagen emissions scandal.

The government has a role to play in meeting all these challenges, whether it is supporting research, aiding the development of international standards, reforming the regulatory framework to keep pace with technology, or leading public debate. I am sure that over the life of this Parliament, the committee I chair will want to watch developments in this sphere closely.

The mass adoption of driverless cars in the UK can only be achieved with the modernisation of the country's roads, writes **Charlie Henderson**, global roads lead at PA Consulting Group

# All dressed up and nowhere to go



**I**n his autumn budget announcement to Parliament last month, the Chancellor of the Exchequer, Philip Hammond, outlined new reforms for on-road testing of automated vehicles (AVs). Hammond wants to see fully autonomous driverless cars on the road by 2021.

While the government should be applauded for its drive to develop such advanced technologies, any notion that AVs are about to become a regular part of everyday life is misguided. The reality is that AVs are unlikely to be a common sight on roads any time soon. Our latest research has found that AVs could be ten years away or more. That's not all bad news; in the intervening period there are some significant challenges to the rapid realisation of AVs – which both government and the private sector need to address. For the UK government, one

of the main challenges is infrastructure, and in particular, designing roads with AVs in mind.

## **Huge investment**

Manufacturers are designing AVs on the assumption that roads are in good condition – with clear lane markings, unobscured signs and signals, and good-quality surfaces. But we all know that's not the reality. We have a hugely diverse infrastructure with much of our road network, in particular the very local roads, in a poor state.

So the question is: should we initiate a full-scale programme to make all 250,000-odd miles of the UK road network ready and suitable for AVs? If so, who is going to pay for it? Would a taxpayer with perhaps no interest in using a driverless vehicle want to pay to upgrade the single-lane track



## Do we design roads for the cars, or cars for the roads?

(nonetheless a public road) to their parents' house in the countryside?

It is far better that manufacturers develop technology that allows the AV to drive regardless of the state of the road. Of course, if and when we're repairing roads we should do so in a way that better supports the use of AVs. But that means a piecemeal approach and could therefore be a blockage to widespread AV use.

### Maintenance

What's more, with mass use of AVs, our roads could need more frequent repair. Not because AVs cause more damage to the road but rather because they're likely to follow the centre of a lane. As a result, road wear will be concentrated to a smaller cross-section of the road. With the same volume of traffic we're likely to see greater road wear (and hence the

need for repairs) with AVs.

We therefore need to change our thinking about road construction. Or we could require that roads authorities tell each AV precisely what part of the road they can drive on to spread wear. The downside of this is that the road authorities potentially become responsible for managing the movement of vehicles.

### Traffic control

There's going to be a mixed economy of vehicles for years to come. But if and when the day arrives that the only type of vehicle on the road is an autonomous one, traffic control will still be an issue. That's not because vehicles won't have the technology to communicate with, and therefore avoid, one another. It's because vehicles aren't the only road users. There are the cyclists, pedestrians and horse-riders who will still require systems to regulate the flow of traffic.

As part of our research, we talked to over 50 influential stakeholders involved in the UK's emerging driverless ecosystem. This included people from manufacturers and their supply chain, highways authorities, insurers and national and local motoring organisations. And 64 per cent said that while exploratory thinking has been done in terms of preparing the roads for AVs, there had been little progress beyond that.

It's good that there's excitement about the possibility of AVs and we applaud the UK government for taking steps to make them a reality. Yet as a society, we need to consider a wider range of issues, and that starts with all things roads. Do we design the roads for the vehicles or the vehicles for the roads? What priority should roads authorities give AVs? And how do we ensure vehicles can safely share the road with others users, such as cyclists and pedestrians?

Autonomous vehicles will be part of our future – advances in technology are ensuring this. We need to start addressing some of the non-technology issues now so we make the most of the opportunities AVs can bring.

# Bad guys don't always have to be behind the wheel



**David Oliver,**  
global transport  
security expert  
at PA Consulting  
Group, explains  
the need for a  
co-ordinated  
UK strategy  
between car  
manufacturers,  
government and  
law enforcement

**T**ransport for London's refusal to renew Uber's licence makes us think, as we often do, about the safety and security of Londoners as they move around their city. In fact, it makes us think about any citizen of any city where Uber operates. The point is not to get into the detail of the story itself: Uber has, as its CEO Dara Khosrowshahi has said, "got things wrong along the way", and that is likely to be true. It is equally likely that some of the attempts to stunt Uber's startling growth – the company more than trebled its net revenue to \$6.6bn from 2015 to 2016 – are driven by something other than regulatory indiscretions. We can be confident, however, that one way or another, this issue will be resolved.

It's relevant, though, because it uncovers an issue that, if left unresolved, presents us with far greater threats than unlicensed taxi drivers. Of course it is

important that 40,000 plus taxi drivers on roads are properly vetted. In fact, nothing is more important than ensuring the safety of our citizens, and goods, as they move around the world. But as we look to the future, is it the licensing of taxi drivers that poses the biggest threat to our safety and security in the transport sector?

The fact is we're still thinking about safety as a human issue, particularly from a security perspective. At the moment, we're worried that the driver of a private hire taxi might be a baddie. But what if the car has no driver? What if the baddie doesn't need to drive the car to engage in criminal activity?

**Exploring autonomous security**  
Driverless cars are a real prospect. Though PA Consulting's latest report indicates that they will not be on our roads for at least a decade, more than



78 per cent of those we surveyed believe that we are only at best at the “exploratory thinking and testing” phase when it comes to law enforcement and security around autonomous vehicles.

A decade is not a long time if you consider the complex and integrated infrastructure, systems and laws that will have to be developed to make them safe for us to use. As autonomous vehicles edge closer to becoming reality, who is doing something about the security considerations?

The government recently announced the launch of its MERIDIAN programme, and has offered £100m to support the testing of AVs, including a security dimension. However, this focuses primarily on data and cyber security, rather than physical or criminal threats. And, to be fair, the FBI did, in 2014, acknowledge that AVs could be used as “lethal weapons”, but this hasn’t developed much further than initial studies. Progress is right and proper, and we should be harnessing the benefits of this innovative technology. But these vehicles need to be safe, and the security risks around them need to be mitigated.

#### **Working together**

So that we can ensure that progress is made to make sure Connected Autonomous Vehicles (CAVs) are safe and secure, this is what needs to happen, with some speed. We must understand and communicate the true security threats of autonomous vehicles. Comprehensive research needs to be undertaken to understand what the true security threat of autonomous vehicles might be. We can imagine that terrorists might seek to use driverless cars in similar attacks to those currently undertaken by human drivers. But what about other criminal uses, such as trafficking or robbery? Until we know more, we can’t communicate the threats to the relevant agencies, and discover how we tackle them.

We should develop a unified approach to security, from auto manufacturers to law enforcement. There are many agents

who need to be involved in developing a security response to autonomous vehicles, from car manufacturers to policy makers and law enforcement agencies. What is clear currently is that there is a lack of co-ordination, with some groups focusing on cyber threats – as the MERIDIAN project outlines – and, as our report shows, others considering the stopping powers on a car that has no driver. We are not currently clear on who is liable, nor on what powers are available to mitigate risks. So the Ministry of Justice, Home Office, NPCC, CCAV, to name a few, need to collaborate and find an approach, and ultimately a response, that all parties are happy with.

International standards must also be negotiated. It will be fantastic if we are able to make progress in securing autonomous vehicles in the UK within a relatively short time frame. This would set out UK PLC as a CAV testbed and an open economy for disruptive technologies. However, if the standards we develop are totally out of sync with our European counterparts, for example, then the security risks will be mitigated in different ways, or worse, not at all, in certain parts of the world. When no one is driving the car, how can we prosecute a criminal act in the UK, if the smuggler ordered their car in another country where the law is different?

As the Uber example shows, we are not even currently managing the current threats that could be posed by disruptive vehicle technology. So how will we tackle the next generation of that, in the form of autonomous vehicles? PA Consulting’s findings show that an open, honest and integrated approach needs to be taken to ensure that neither the UK, nor other countries, are left vulnerable to the new threats that driverless cars might present.

If we don’t develop the right strategies to mitigate these threats, we risk developing a mode of transport that exposes already over-burdened enforcement agencies to a roads ecosystem for which they are not properly prepared.



## **There are risks beyond taxi licensing**

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