

ice

Institution of Civil Engineers

THOUGHT LEADERSHIP

# AUTONOMOUS VEHICLES – DRIVING ALL OUR FUTURES?





A dinner was held at The Athenaeum on Wednesday, 7th September 2016, to discuss the potential of autonomous vehicles (AVs) to transform mobility and the cross-sector challenges for their commercialisation. The dinner was held under the Chatham House Rule. The following is a non-attributable summary of the key issues raised.

#### Organisations represented at the dinner

- Chartered Institute of Highways and Transportation
- Department for Transport
- EE
- Highways England
- Institution of Civil Engineers
- Jaguar Land Rover
- KPMG
- London First
- Old Oak and Park Royal Development Corporation
- Pinsent Masons
- Transport for London
- University of Surrey
- University of West England
- WSP | Parsons Brinckerhoff



#### Are autonomous vehicles inevitable?

With increasing acceptability across the professional services that the introduction of autonomous vehicles (AVs) to our streets and cities is now inevitable, it seems only a matter of time before the technology becomes a commercial reality.

There are numerous safety, efficiency and environmental benefits to AVs, and they have the potential to substantially improve our public spaces – creating environments that are no longer dominated by cars. City centre car parks and road side parking spaces may no longer be required, creating better spaces for walking and cycling. All of these changes could transform our urban areas into places designed for people, not machines.

The light-touch regulatory approach that is being taken to the testing of AVs on UK roads suggests that the Government is also fully committed to the technology.

But what is equally clear is that there are a number of challenges that must be overcome before AVs can become the transport mode of the future.



## Is Government doing enough to raise public awareness and acceptability of AVs?

#### Immediate challenges: public trust and shifting liability

Public awareness and by extension public trust are potential blockers for AVs.

While for infrastructure professionals AVs are a common part of the conversation on the future of mass transit, *surveying*<sup>1</sup> has demonstrated that the public is far less aware. Further still, where awareness does exist there tends to be a large degree of scepticism around the safety of AVs.

The shift that AVs will create in the allocation of legal liability is also a considerable challenge. As liability begins to move from human drivers to the manufacturers of AVs, substantial changes to regulatory and insurance models will be required.

## Is mobility as a service the future?

<sup>1</sup> uSwitch (2015) Half of Brits unwilling to be a passenger in a driverless car.

#### The transitional phase

There are technical and practical issues that need to be addressed in the interim period between the introduction of the first AVs and the point at which they reach commercialisation.

Road networks and public spaces will require re-engineering in order to allow AVs to share them with human-driven vehicles, cyclists and pedestrians. Their position within the wider mass transit system will require careful and strategic planning in order to create an environment for safe interaction.

Looking forward from now, we have two innovation paths in play around the world that are moving the entire industry towards fully autonomous vehicles.

The first is exemplified by the UK funded trials, where bespoke vehicles capable of full automation are being tested at slow speeds to cope with increasingly complex manoeuvres. The second is the Tesla-type path, loading modern cars with increasing - but currently much lower - elements of autonomous operation at higher speed.

As yet, the latter cannot cope with the full complexity of the road environment at speed, while the former cannot cope with higher speeds. The two paths will converge at some point in future, but each will go through a distinct transition.

In the meantime, those responsible for operating and maintaining our roads are urged to think carefully about their desired outcomes and wider long-run place or route-making potential, rather than simply waiting for the new vehicles to appear on the network.



## An algorithm for improving the quality of life?

#### Connected vehicles and their wider benefits to society

Despite grabbing headlines, fully autonomous operation is not the only exciting development taking place in the mobility sector.

Connected vehicles, irrespective of autonomous or self-driving capability, have the potential to reduce road accidents and smooth traffic flows. Presuming that they will be electric or hydrogen-fuelled, they will have lower energy consumption and so could significantly reduce the point-of-use environmental impacts or road based transport. There are also some key developments around shared use and mobility as a service likely to come on-stream in the near future.

Within the wider context, AVs are one part of a better connected system of infrastructure service delivery; integrated and smarter energy, transport, waste and water networks that improve the living environments in our towns and cities.





## Do customers want autonomous vehicles?

### What else do we need to get there?

The multi-disciplinary nature of the challenges associated with the commercialisation of AVs calls for cross-sector collaboration. From a civil engineering standpoint, this means working with the AV manufacturers and technologists to develop the core and digital infrastructure that will be necessary to enable this new mode of transport.

There is also an onus on government and the private sector to work together to establish an effective regulatory framework for the operation of AVs, beyond that which is currently in place for testing.

Yet perhaps the most difficult exercise in collaboration is drawing each of these cross-sector stakeholders together in order to influence the thinking of the public i.e. the customers of tomorrow.

A discussion of the high-level benefits of AVs and connected vehicles among the skilled professionals that will deliver them is one thing. Creating the same sense of enthusiasm and inevitability among the public is another.



### ICE infrastructure transformation

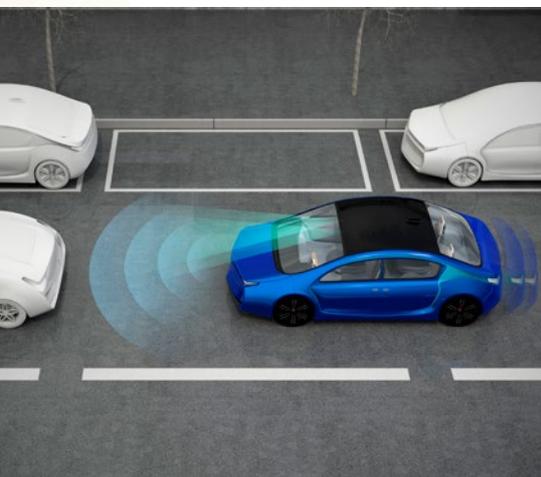
ICE's infrastructure transformation programme is bringing together relevant key stakeholders from a number of sectors to explore and investigate a range of industry trends, and specifically the opportunities and challenges with which today's civil engineers need to engage.

This work is also focused on identifying solutions and highlighting the integral role of civil engineers in delivering quality infrastructure services and services across the UK.

**There are a range of ways to get involved in the programme - from contributing blogs and short videos through to attending ICE roundtables and workshops.**

To get involved contact  
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## About ICE

**Established in 1818 and with over 90,000+ members worldwide, ICE is a leading source of expertise in infrastructure and engineering policy and is widely seen as the independent voice of infrastructure. ICE provides advice to all political parties and works with industry to ensure that civil engineering and construction remain major contributors to the UK economy.**

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