Agenda - Economy, Infrastructure and Skills Committee

Meeting Venue:

Committee Room 1 - The Senedd

Meeting date: 23 May 2018

Meeting time: 09.15

For further information contact:

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Committee Clerk

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Private pre-meeting (09.15-09.30)

1 Introductions, apologies, substitutions and declarations of interest

2 Self-driving vehicles - Automation and the Welsh Economy

(09.30-10.45) (Pages 1 - 32)

William Sachiti, Chief Executive Officer, Academy of Robotics

Dr Wolfgang Schuster, Technical Director, Atkins - member of the SNC-Lavalin Group

Dr Paul Nieuwenhuis, Senior Lecturer in Logistics and Operations, Cardiff University

Attached Documents:

Research brief

EIS(5)-13-18(p1) Atkins report - Self-driving vehicles

EIS(5)-13-18(p2) Open University

3 Motion under Standing Order 17.42 to resolve to exclude the public from the remainder of the meeting

Cynulliad Cenedlaethol Cymru National Assembly for Wales

4 Forward Work Programme

(10.45-11.15) (Pages 33 - 36)

Attached Documents:

EIS(5)-13-18(p3) Forward Work Programme

5 Paper(s) to note

5.1 Draft letter to Cabinet Secretary for Energy, Planning and Rural Affairs regarding Precision Agriculture

(Pages 37 - 41)

Attached Documents:

EIS(5)-13-18(p4) Draft letter

Private de-brief (11.15-11.30)

Agenda Item 2

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Automation and the Welsh Economy - Self-Driving Vehicles

Intelligent Mobility with Atkins

Economy, Infrastructure and Skills Committee
National Assembly for Wales

14 May 2018

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This document has 14 pages including the cover.

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Rev 2.0	Review edits	NB				14/05/18

Client signoff

Client	
Project	Automation and the Welsh Economy – Self-Driving Vehicles
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Contents

Executive Summary

Created for the National Assembly for Wales, this document reviews some of the key transportation-related challenges that society and government are facing with the advent of Self-Driving Vehicles to Wales, and the rest of the UK. By exploring the current operating context in the transportation sector, the document identifies a number of opportunities and challenges that these trends present.

SNC-Lavalin's Atkins business is directly involved in shaping the future of mobility and transportation through Intelligent Mobility (iM), focusing on innovative ways to make mobility easier, safer and greener - improving people's lives and wellbeing while optimising existing local transport systems and services.

Three key trends that Atkins expects to revolutionise our transportation system over the coming years include:

- The use of data to optimise the efficiency of transport systems;
- Connected and Autonomous Vehicles (CAVs) – often referred to as "self-driving" vehicles; or "driverless cars";
- Mobility as a Service (MaaS).

The term "automation", with a specific focus on vehicles, is explored in this paper.

There is no doubt that the growing range of "smart" vehicles being introduced onto our roads - including Autonomous (self-driving) Vehicles, Connected Vehicles, Connected and Autonomous Vehicles and Electric Vehicles - is already presenting a number of opportunities and challenges to towns and cities across the UK. It is important to understand the strategic impact, and potential of all of these vehicles to Wales' transportation system.

To help, we have provided a few examples from Atkins' project portfolio - to show what is currently happening in the intelligent mobility space, and to explore how this might be applied to Wales.

For example, can intelligent mobility help Wales to better connect disparate communities with connectivity challenges; or support social inclusion (especially for the elderly or those with accessibility requirements); and improve access to employment, health and leisure opportunities, by providing citizens with a more inclusive and encompassing travel experience?

iM has the power to transform lives and our socio-economic system. By creating solutions for people's journeys and the movement of goods that will allow end-users and stakeholders to make optimal lifestyle/business choices that were previously inaccessible or unavailable to them, iM has the potential to increase the efficiency, sustainability and safety of transport.

1. Introduction

The UK's transportation sector is facing many well documented challenges, including network overload, safety and security concerns, environmental challenges and the need for lower operating costs and increasing efficiencies.

Alongside this, transport demand is continuing to increase in towns and cities, and with the ([UN] expecting two thirds of the world's population to live in cities by 2050, space will be limited. Increasingly, we need to unlock more capacity through more efficient and flexible use of infrastructure.

At the same time, digital is shaping the opportunities of our physical transport and infrastructure world and these rapid advances in technology provide new opportunities to connect people (digitally and physically through transport) and are disrupting established ways of doing business.

Supported by appropriate legislation, digital has the potential to provide opportunities to address some of these fundamental challenges that we are facing as a society in the transportation sector.

At the core, there is a need to gain a much better understanding of what society and people need and want, so that we can design human-centred solutions that are trusted and accepted. In turn, accelerating the adoption of new or improved ways of travelling for the benefit of all society.

We need to ensure the right infrastructure is in place for digitally enabled services to operate effectively.

For Wales in particular, we need to have urban transport systems which are efficient and safe, as well as urban and rural transport systems which ensure that citizens are sustainably connected to employment, health, leisure and education opportunities, in line with the Well-being of Future Generations Act.

A new approach is needed to sustain and improve transportation services and capacity across all transport modes, while future-proofing infrastructure to meet these demands.

2. About Intelligent Mobility

Intelligent Mobility is an end-user and outcome-focused approach to connecting people, places and services - reimagining infrastructure across all transport modes, enabled by data, technology and innovative ideas.

'iM' is Atkins' approach, through which we will demonstrate our intelligent mobility credentials, and facilitate collaboration between partners, clients, governments and the private sector to drive essential progress - for the benefit of end-users worldwide.

iM's' purpose is not just to imagine what the future of mobility will be like. It exists to demonstrate how Atkins turns innovative ideas into practical applications, and to bring together like-minded partners who can bring those ideas to fruition across transport and infrastructure worldwide.

Through our collaborative approach, engineering expertise and deep industry knowledge, iM can bring together the right people to better inform decision making, co-create solutions and encourage a positive change in end-user behaviour, transforming ideas into reality and shaping the future of transportation.

iM with Atkins are already working with industry leading experts and best in class partners, including government, local and national transport authorities, city councils, transport providers, network operators, data providers, charities, academia and vehicle manufacturers, to optimise transport systems.

Visit our iM Hub: www.atkinsglobal.com/im

3. Automation

This section explores what is meant by automation in terms of vehicles, which can range from automation of certain functions, to vehicles which drive fully autonomously and communicate with other vehicles and infrastructure.

3.1. Smart Vehicles

Autonomous (Self-Driving) Vehicles

With various levels of Autonomous (Self-Driving) Vehicle (AV) technology, from driver assist through to fully automated driverless vehicles, it's important to understand the different terminology used. The SAE International Standard J3016, sets out the taxonomy used when discussing the levels of autonomy:

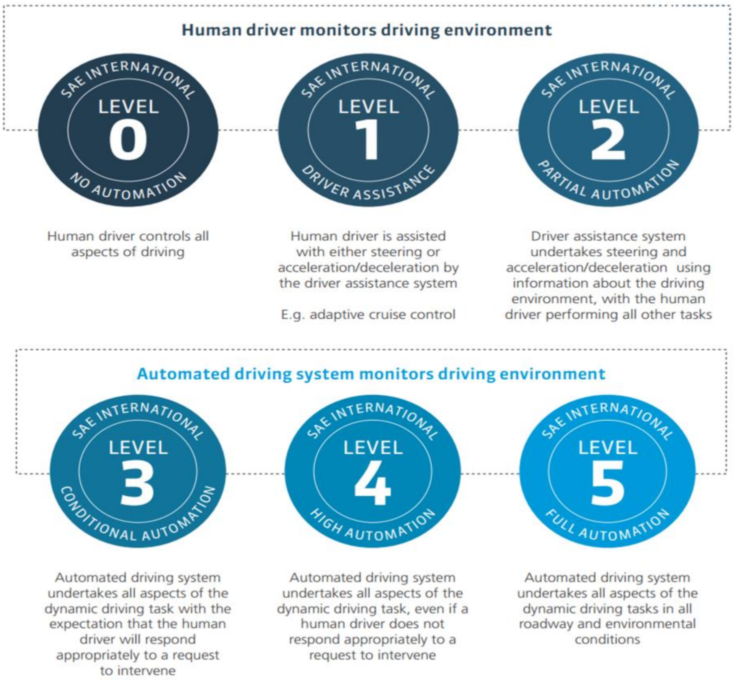

Figure 3-1 - Autonomy Scale

A fully autonomous self-driving vehicle, as described by the Department for Transport's (DfT) Code of Practice, 'is one in which a driver is not necessary'. That's to say, there will be people in the vehicle, but they are not responsible for the driving. The Code goes on to say, 'The vehicle is designed to be capable of safely completing journeys without the need for a driver in all traffic, road and weather conditions that can be managed by a competent driver'.

The reality is that there will be elements of full and partial autonomy delivered into the market place at different rates. Vehicles with partial autonomy are already becoming available in the market place, such as self-parking, advanced driver assistance, lane control and autonomous emergency braking systems.

Connected Vehicles

Connected vehicle (CV) technologies allow vehicles to talk to each other and the wider world. Vehicles today are already more connected than many realise. Satellite Navigation systems already include connected vehicle functionality, such as dynamic route guidance. 'eCall' (emergency call) is a CV capability that is currently being provided by several vehicle manufacturers, and which the EU plans to make a legal requirement in all new vehicles. When a car is involved in an accident, it will detect what has happened (such as air bag deployment) and set up an automatic voice call to a control centre. At the same time, it will use GPS to send precise location details, so the emergency responders can set off faster and have more details of the situation.

Generally, the technologies being developed to support CVs include:

Vehicle to vehicle (V2V) technology	**Vehicle to infrastructure (V2I) technology**	**Vehicle to everything (V2X) technology**
Allowing vehicles to communicate with one another about for example, traffic conditions.	Connectivity between vehicles and highway infrastructure, for example, vehicle to traffic signal communications to provide guidance on signal phasing.	Connectivity between the vehicle and all appropriate technologies.

Table 3-1 - Vehicle Technology

Connected and Autonomous Vehicles

Connected and Autonomous Vehicle (CAV) technologies are not necessarily reliant on one another. However, the combining of CAV technologies within vehicles allows for safer, quicker and more efficient movement. This is achieved by allowing computer driven vehicles to 'know' the conditions of the road network ahead, undertake rerouting based on new information (such as a lane closure) and warn vehicles behind of incidents – such as the need to avoid an obstacle.

CAVs are no longer a question of 'if' but rather of 'when'. There are significant economic and social benefits associated with their take up, including increased safety, reduced congestion and reduced emissions.

From a user perspective, the deployment of CAVs will provide a time and space for other activities to take place from catching up on work to leisure activities. Elements of automation and vehicle connectivity are already here. Self-parking, lane keep assistance systems and adaptive cruise control are all features of autonomy that give the driver added value and safety during their journey.

The challenge exists for cities, companies and road authorities to understand what the impact of CAVs will be and how to maximise the opportunities that they will bring, in order to better manage our networks today and in the future.

Electric Vehicles

Electric Vehicles (EVs) are powered using electric motors as opposed to internal combustion engines. Research into cleaner and greener mobility continues to bring many improvements to traditional internal combustion engine vehicles, resulting in new low emission vehicles on the mass market. Electric vehicles are increasing in popularity across a range of uses from personal to mass and bulk transit, such as fleets and freight.

The number of electric cars on the world's roads are increasing and alongside rapid advances in electric vehicle technology, are impacting the number, and type of vehicles on our roads.

The contribution that petrol and diesel vehicles make to poor air quality and the impact on our health are well documented. Improving air quality is a challenge that many major towns and cities are tackling around the world so that together, we can meet air quality targets and create a future that is healthier, safer and happier for all of us.

With emissions from traditional vehicles currently a main contributor to poor air quality, the increase in EVs has the potential to significantly improve urban air quality. It is anticipated that most, if not all, CAVs will be powered electrically.

3.2. Benefits and Opportunities

Safety
Over 90% of accidents involve driver error, machines could drive more reliably than humans. By greatly reducing the opportunity for human error, technology in CAVs have the potential to significantly reduce the number of crashes.

Reduced Congestion
Through CAV technologies, vehicles could drive closer together, which would increase roadway capacity without impacting safety since machines can help maintain much shorter minimum distances between vehicles compared to human drivers and still be safe. Governments cannot keep building roads and adding lanes to meet demand, so CAVs have the potential to be the vital next big step for increasing capacity.

Network Management
CAVs provide transport planners with the opportunity to capture and exploit valuable anonymised data, collected from the vehicles, in order to improve transport networks and understand how people interact with the network. This could result in optimised networks which directly respond to travel trends and demands or could help members of the public with improved travel information about their journeys.

Reduced Emissions – Cleaner Air
As mentioned before, most CAVs are expected to be electrically powered, which potentially bring a range of benefits including lower exhaust emissions, a key contributor to air pollution.

CAV technology allows cars to safely and closely follow one another at high speeds, communicating with each other about their relative movement. Vehicle platooning has the potential to reduce air resistance for following vehicles, and improved traffic signal information could lead to more optimised speeds and support lower emissions from the vehicles.

In Wales, consultation into Clean Air Zones is already underway, and temporary speed limits were recently introduced on five congested stretches of motorway and trunk road. CAVs and EVs clearly offer future benefits in this area.

More Time, Less Stress
If humans are not driving, they can be working or relaxing. Stress levels will be reduced overall, which will positively impact health and can lead to increased productivity levels at work.

Social Inclusion and Public Connectivity
Anyone can potentially use CAVs. Those with accessibility needs, younger or older people would all have increased mobility, surely one of the greatest potential benefits of CAVs? This could potentially change people's relationships with cars. CAVs could bring together disparate communities by providing vehicle connections.

Mobility as a Service (MaaS) is a further opportunity to improve urban and rural connectedness. MaaS redefines how a transport system is offered, it puts the customer first and uses new technology and 'joined up' transportation networks and systems that customers rely on (real time information, integrated ticketing etc.), to offer a travel experience that answers the public's demand for transport that best respond to their needs.

Improved road design
The design of CAVs could remove the need for crash barriers, which when combined with the replacement of signs with in-vehicle information, could lead to our roads becoming less cluttered and more attractive.

Physical Infrastructure
More widely, cities should consider the implications of CAVs on new transport schemes. For example, the congestion benefits realised by CAVs may negate the need for construction of more roads; if CAVs are shared and not owned by individuals there may not even be the need for car parks.

3.3. Challenges

Digital infrastructure

Many of the benefits to be delivered by CAVs will be enhanced through connectivity between the vehicles and wider infrastructure. Wireless connectivity networks within urban areas will allow vehicles to communicate with traffic management systems in real time, sharing information such as signal phasing and timing and live traffic conditions.

Cities and road transport authorities play a critical role in delivering, ensuring the required digital infrastructure networks are in place to meet the demand. Cities must consider the systems and technological standards that will ensure that the opportunities provided by CAVs are fully realised.

Cyber Security

Public acceptance of CAV technology and the safety and security of the vehicles rely on secure cyber ecosystems. Data and information must be protected from external and internal attacks that will occur. Large global companies must both ensure and protect the flow of data across their organisation. Given this, it is vital that organisations maintain a real time understanding of the security of their network, and the threats, mitigations and weaknesses that exist 24/7.

When EVs are built into citywide planning, and energy provision comes from multiple sources, the security of the electricity network and infrastructure are key considerations; who can access the network, how, and who can't? Energy being syphoned needs to be considered.

Physical Infrastructure

Cities should consider how their infrastructure – from traffic signals and lamp posts to roads and bridges – is prepared to accommodate CAVs. This is particularly important as infrastructure is replaced or renewed through maintenance and improvement.

Rather than replacing like-for-like, cities should consider how infrastructure can be upgraded in preparation for CAV adoption.

Cities also need to consider that most CAVs and cars alike are turning more towards electric power, which will require charging. As EV numbers increase, so does the need for more rapid and 'on demand' charging points. Electric vehicles could put strain on the power network, and therefore require other intelligent charging solutions such as vehicle-to-grid. Emerging technologies such as blockchain and its potential use in mobility payments, EV energy pricing and asset valuation could also be explored.

Insurance

From an insurer's perspective the fundamental question will be to determine whether the driver or the car was at fault at the time of a collision i.e. who was in control of the vehicle at the time?

The issue of ownership will be critical to determining whether any personal cover is still warranted, and to carefully consider whether the vehicle manufacturer or software manufacturer will be liable in the event of an accident.

Safety and Ethics

CAVs are hailed as being safer, but this will mostly be realised further in the future. In the beginning it is anticipated that there will be mix of fully-autonomous, semi-autonomous and human driven cars all sharing the same road. With this landscape many unpredictable circumstances may occur, and cities will need to plan their roads accordingly.

Ethics will also be brought into question with a rules engine being used to make decisions which a human mind may be in a better position to judge. Intelligence needs to be programmed into a vehicle, which will need to respond to potentially ethical situations.

4. Intelligent mobility with Atkins: project examples

iM with Atkins is proud to be collaborating and working with a wide range of best in class partners and industry leading experts on a range of intelligent mobility projects. Here are just a few examples:

4.1. FLOURISH

FLOURISH is a multi-sector collaboration, helping to advance the successful implementation of connected and autonomous vehicles (CAVs) in the UK, by developing services and capabilities that link user needs and system requirements. The three-year project, worth £5.5 million, seeks to develop products and services that maximise the benefits of CAVs for users and transport authorities. FLOURISH is co-funded by UK government.

The FLOURISH partners, which include Cardiff University, see connectivity and customer interaction as important elements of the design of Connected and Autonomous Vehicles.

FLOURISH aims to build solutions that are capable of:

- Improving mobility for older people and those with assisted living needs
- Developing secure and trustworthy mobility solutions to support future CAV deployment
- Optimising traffic management at a regional level.

Visit the FLOURISH homepage: http://www.flourishmobility.com/

4.2. VENTURER

Atkins is leading the VENTURER consortium. Co-funded by the UK government, VENTURER is a rich partnership of public, private and academic experts, which is establishing the South West of the UK as a centre of excellence for the safe trialling of Connected and Autonomous Vehicle (CAV) technology.

VENTURER focuses on the users as well as the technology enabling CAVs, in order to understand the blockers and drivers to wide-scale adoption of CAV capability.

The VENTURER trials go hand in hand with developing an understanding of the insurance and legal implications of increased vehicle autonomy. VENTURER conducts its trials using both realistic simulation environments and a controlled road network.
Visit the VENTURER homepage: http://www.venturer-cars.com/

4.3. HumanDrive

Atkins has been chosen to develop the cyber security model and framework for the HumanDrive Connected and Autonomous Vehicle (CAV) project. Supported by consultancy SBD Automotive, Atkins' work will ensure the vehicle is digitally secure, resulting in a safer driving experience.

In late 2019, HumanDrive will complete a 200+ mile journey across the UK, setting a precedent in the UK for the successful deployment of an autonomous, human-like vehicle undergoing a complex journey through real-world driving conditions. The project will develop an advanced vehicle control system, designed to allow the vehicle to emulate a 'natural' human driving style and using machine learning. Artificial Intelligence will enhance the user comfort, safety and experience.

Visit the Human Drive homepage: https://humandrive.co.uk/

4.4. Modelling the Impact of CAVs

Atkins has advised the Department for Transport (DfT) on the potential impact of connected and autonomous vehicles (CAVs) on the UK road network. The project modelled the increasing presence and capability of CAVs in urban areas and on the strategic road network. The results illustrated the potential impact on journey time, delay, safety and road space management for a variety of scenarios; these results were used to inform policy regarding both CAVs and future road investment.

4.5. Flying High, Nesta

Atkins are one of several organisations selected to support the West Midlands Combined Authority in the Nesta Flying High Challenge to explore how drones can be used to have a safe and positive effect for businesses and communities across the UK.

Led by the West Midlands Combined Authority (WMCA), Atkins are part of the group working with the Flying High team to investigate the use of drones to improve public services and encourage commercial opportunities, with a focus on Future Mobility Solutions. The group will start by testing drone technology and operations on incident response, assessment and treatment on the highway network, before broadening the scope of the Mobility programme. The group will also explore public attitudes, the environmental impact, logistics, safety and the regulation of drones operating in complex urban environments.

Read this article for more information: http://www.nesta.org.uk/news/five-cities-bringing-drones-uk

4.6. TOC Ability

Atkins are part of a seven-partner consortium who are developing a digital platform that is setting out to improve the rail travel experience for disabled passengers in the UK. TOC Ability is set to transform future rail services for disabled passengers, who are often the most vulnerable, so they feel confident to travel. By improving ways that passengers and operators communicate and interact, the project will aim to provide an efficient and improved service experience.

Valued at around £1.4 million, TOC Ability will run for a period of 18 months. Testing, in a live train station environment in London, will start in Summer 2018.

Visit the TOC Ability homepage: https://enableid.com/toc-ability/

4.7. Transport for Greater Manchester (TfGM) Mobility as a Service (MaaS)

Atkins are conducting trials and research as part of Transport for Greater Manchester's (TfGM) vision to make travel easier for all residents, their MaaS project will use smart technology to study how people could, in the future, plan and pay for their door-to-door journey - trams, buses, bike hire and even ride-sharing - in one transaction.

Responding to complex congestion issues and trends that find fewer people are using cars - especially in Manchester city centre - the research project aims to encourage take-up of public transport by finding ways of personalising the experience for users.

Greater Manchester is to become one of the first regions in the UK to research and develop a business model around Mobility as a Service (MaaS). MaaS puts the customer first and uses new technology and 'joined up' transportation networks and systems that customers rely on, to build citywide travel that answers the public's demand for transport that best respond to their needs.

Projected benefits to the region include a better travel experience for users, and it's hoped, fewer cars on some of the region's busiest roads - potentially leading to less congestion and pollution and increased health and wellbeing.

Read this article for more information: http://www.atkinsglobal.com/en-gb/media-centre/news-releases/2017/oct/2017-10-20c

4.8. M25 Mobile Data

The M25 is one of the busiest motorways in Europe and measuring journey times using the traditional methods of Automatic Number Plate Recognition (ANPR) and Bluetooth is expensive to maintain and install.

A partnership between Atkins and EE supplies journey time data analysis as an independent metric for use in CPS Operation and Maintenance contract, using anonymised and aggregated mobile phone data to derive the average journey time.

This project provides the unique capability to reduce the roadside infrastructure required by Highways England and other Local Highway Authorities, therefore generating significant financial savings as well as multiple safety benefits. This work has created a valuable data source for future monitoring and management of the Highways England network.

Read this article for more information: http://www.atkinsglobal.com/en-gb/angles/all-angles/mobile-data-m25

5. More Information

Useful Websites:

Atkins Homepage:	http://www.atkinsglobal.com/
IM Hub:	www.atkinsglobal.com/im
Atkins Whitepapers:	http://www.atkinsglobal.com/en-GB/about-the-group/our-publications

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Submission to the Economy, Infrastructure and Skills Committee inquiry into automation.

Connected and Autonomous Vehicles (CAV) – a summary of the Milton Keynes experience and wider considerations

The Open University (OU) is pleased to offer this short paper to the committee in respect of its inquiry into automation and the Welsh economy. The OU has considerable experience in both the automation and smart city fields and is a key partner in the MK:Smart project. This paper draws on the published documents from the UK Autodrive project (a project in which Milton Keynes Council and The Open University are partners) and provides evidence based conclusions on the implications of Self-Driving Vehicles in Milton Keynes and the wider context.

The potential for Self-Driving Vehicles

According to research automated driving will:

- Increase road safety, as human error is involved in more than 90% of all EU traffic accidents.
- Reduce congestion as vehicles can travel in closer proximity
- Reduce emissions by automating driving behaviours and adopting greater use of Electric Vehicles
- Automate delivery services

Milton Keynes are engaged with three R&D scenarios. Namely, last mile autonomous passenger transport, delivery pod services and the test of CAV M1 vehicles on public roads.

The last mile passenger pods will run on the pedestrianised areas of the city centre, not on public roads, to comply with governance for road use. The potential benefits of the service include ease of people movement, wider accessibility for less able citizens, reduction in motorised vehicle journeys in the city centre and increased visitors to the city.

Starship delivery pods are already running a grocery delivery service in one residential district of Milton Keynes. This is testing the feasibility of increased delivery capacity for last minute, low volume, low value goods using small Autonomous Robots using pavements. This has proved very popular in the area of trial.

Trials of M1 passenger vehicles have already taken place on the roads of MK. The potential for these is the development of global traffic management solutions.

The potential for rolling them out across the UK and beyond.

"UK and Europe have the chance to lead the transition towards an integrated and truly multimodal transport system. CAVs can play a significant part in that system but, in order to do so, they need to be able to operate in a connected way that allows traffic flows to be optimised. Simply adding autonomous but unconnected vehicles onto our roads could in fact be counter-productive as AVs replace journeys previously taken on shared public transport and AVs behave in an ultra-cautious manner slowing down traffic flows. AVs must be connected in order to reap the networked benefits and form part of a multi-modal transport system." Stuart Young, Gowling WLG, UK Autodrive.

How people are responding to them

The UK Autodrive Public Attitudes Survey worked with data from 2850 validated responses to a survey to determine Attitudinal Findings and identify Social Segments. Below are some key infographics representing the findings.

Would you use a driverless vehicle?

What do you consider the benefits to be?

Social Grouping adoption of AVs

Potential policy/regulatory problems for governments

Regulation of automated vehicles faces challenges to establish rules for technologies not yet applied. In particular, appropriate safety requirements have to be agreed. Traffic rules and the regulatory framework need to be adapted. In addition, it has to be decided how the safety of automated vehicles should be tested and by whom. The further development of vehicle automation will demand an adaption of driving education and licensing. For example:

The Vienna Convention on Road Traffic 1968 applies in EU (UK has not ratified this) One of the fundamental principles of the Vienna Convention is the concept, as laid down in Article 8, that a driver is always fully in control and responsible for the behaviour of a vehicle in traffic.
(1): Every moving vehicle or combination of vehicles shall have a driver.
(5): Every driver shall at all times be able to control his vehicle.

Type Approval
The common legal framework for the approval of motor vehicles and their trailers is provided by Framework Directive 2007/46/EC. Within the EU, mass-produced cars may only be used on public roads if they are type-approved in compliance with the administrative procedures and technical requirements established by the Directive. This will need to be adapted to Connected and Autonomous Vehicle development.

Cybersecurity
As our vehicles become increasingly connected they increase the number of opportunities for hackers to intercept and manipulate data. In 2015, the Alliance of Automobile Manufacturers formed a voluntary information sharing and analysis centre (Auto ISAC) for the industry, to target the threat of hackers. The European Automobile Manufacturers Association (ACEA) has agreed on principles of data protection in relation to connected vehicles and services.

GDPR
GDPR will result in compliance obligations and significant fines for those that do not comply. This could suppress R&D or any connected car related services which involve personal data.

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References
http://www.ukautodrive.com/

https://ts.catapult.org.uk/innovation-centre/cav/cav-projects-at-the-tsc/self-driving-pods/lutz-pathfinder-automated-pods-project-faq

http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573902/EPRS_BRI(2016)573902_EN.pdf

Agenda Item 4

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