### Autonomous Vehicles: The Public Policy Imperatives

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- **The transport revolution**
- **Social impact**
- **Economic impact**
- **The two great uncertainties**
The transport revolution

Mobility as a service

Electric vehicles

Autonomous vehicles

Economic impact
US (US$1.3 trillion)

Productivity benefit: US$422 billion
Accident cost benefit: US$563 billion
Reduced congestion benefit: GBP138 billion
Fuel cost benefit: GBP158 billion

Canada (CA$65 billion)

UK (GBP51 billion)

Productivity benefit: GBP35 billion
Wider economic benefit: GBP16 billion
Reduced insurance and parking cost: GBP5 billion
Increased taxation: GBP2 billion

Social impact

Smiley face: Stress free AV

- 90%–95% of car accidents are caused by human error
- Additional jobs in automotive and supply chain. UK estimate 320,000
- Lifestyle and leisure benefits especially for those with children
- Accessibility for the young, old, disabled especially in rural communities

Sad face: Loss of low-skilled jobs in cab industry

Use of autonomous vehicles for criminal activity


The two great uncertainties
The two great uncertainties

- More vehicles or fewer?
- Private or fleet ownership?

- +1 trillion personal miles travelled by 2050
- +4 trillion vehicle miles travelled by 2050
- Generational culture: Millennials don’t own
- On-demand MAAS – why own if no need?
- Average car utilization today = 5%
- Technology product needs rapid fall in cost
- New York would need 30% fewer AV taxis
- Personal office/mobile home

Investment appraisal

30–50 year appraisal period

Road infrastructure
- AV telematics
- Roadside signage
- Crash barriers
- Lane widths, curbs?

Public transport infrastructure
- Cycling and walking
- Interchange and parking
- Buses and rapid transit
- Traffic management technology

Revenue

- Need to replace declining gas tax/fuel duty revenues
- Need to fund infrastructure for AVs: traffic management systems and telematics
- Need to manage potential congestion through incentive based charging

- Introduce charge on data transfer between vehicles and infrastructure?
- Use traffic management system to introduce access permits?
- Introduce distance based charging mechanisms/incentive pricing?
- Pass responsibility for paying for all digital infrastructure to the private sector?
- More efficient tax if levied on AV fleet owners rather than users?
- Ancillary revenue from advertising on route and mode choice info systems?
Licensing and regulation

**Driver licensing**
- In a world without drivers, is there any longer need for driver licensing?
- Fitness to drive is no longer relevant
- But driver licenses are used in many countries as a main form of citizen ID
- And incentive based charging regimes may require identification of AV users

**Vehicle licensing**
- AVs should be much safer than conventional vehicles
- So is it necessary for AVs to be subject to typical vehicle testing regimes?
- Other products are subject to safety obligations on manufacturers
- Controls may be required on data security and use

**Road traffic regulations**
- Road traffic regulations are designed to be learned and obeyed by drivers
- In an AV world regulations become connectivity standards, operated like internet protocols
- But they may need to flex in real time to cope with changing conditions/congestion

Safety and security
Safety and security

100 million

lines of code in a new Mercedes S Class. 300m in an AV. Only 15 million in a Boeing jet

Data ownership.
How can traffic management systems access the data they need?

Data privacy.
How to incentivise individuals whilst protecting individual data?

Data security.
Public or private responsibility? Who sets the rules and who monitors?

Data value.

85% of automakers admit their organizations have had data breaches in the past 24 months

KPMG: Your connected car is talking. Who’s listening. 2016
Spatial planning

Cost per half hour of travel

- Private vehicle
- Ride-sourcing
- AV ride-sourcing
- AV ride-sourcing pooling

(un) / perceived
- GST (10%)
- Uber share (20%)
- Driver's time
- Finance, depreciation
- Registration and insurance
- Maintenance and tyres
- Fuel

Thought leadership
Thought leadership

Five areas where AVs will have significant implications for public policy and service

Predicts inner-city densification from greater take-up of on demand mobility, as AVs highlight the high cost of car ownership

Estimates the value to the UK economy of AVs at £51 billion per annum

A detailed study of the potential impacts on the insurance industry as AVs become prevalent

Explores the value and the risks associated with data-driven autonomous vehicles

Ground breaking US report from 2012 which heralded the AV revolution

2013 market research on customer willingness to embrace AVs

The era of the two car family is in decline with the rise of mobility on demand

Predicts 4 trillion more vehicle miles travelled by 2050 in the US alone, as a result of the AV revolution

How deep learning is creating the brain of autonomous vehicles and will allow them to cope with the unpredictable

Key contacts
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AV video

View the video in browser: