Autonomous Vehicles

What They mean for the Future of Motor Insurance

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Insurance institute of Preston

Thursday Sept 21st 2017

redefining / standards

Driverless cars – The Future of Road Transport and the Implications for Insurance

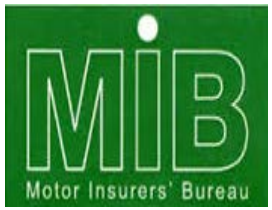
In the talk I would intend to cover off the Government backed consortia working on this subject (we are involved with 4 of which Venturer in Bristol is 1, the other 3 are UK Autodrive in Coventry/Milton Keynes & Flourish which is a combination of the two, and then we have the recently announced ‘CAPRI’!). We will look at the ongoing government discussions, the proposed Vehicle technology and aviation bill and the wider implications of European restrictions/ opportunities. Data will be a key are going forward and we will look at the issues in that regard, together with the wider work carried out by Thatcham and the ABI ADIG (Autonomous Driving Group). Whilst nothing is in anyway certain we will also look at the potential impact on insurance risks and products in a future of connected & autonomous vehicles, and speculate as to how quickly we will see these vehicles on UK Roads. We will also briefly discuss the implications for the commercial vehicle space (its not just Cars!) and particularly the UK haulage industry.

Learning objectives

- Details of the governments work with regard to making connected & autonomous vehicles (CAV's) a reality for the UK including the Implications of the 'Vehicle Technology & Aviation Bill'
- Gain an understanding of some of the Government backed consortia and why insurers are involved in these
- Discuss possible impacts of CAV's on the current insurance market, including changes to Motor and Public/Products Liability
- How the UK Insurance industry is responding and the workings of the ABI ADIG
- Possible Timelines for the various stages of Driver assistance systems moving through to fully autonomous driving

Automated Driving Insurance Group (ADIG)

Association of British Insurers



Why are Insurers Involved?

35 Million Vehicles
licensed on the road

This figure has increased every year since the end of the Second World War (except 1991)

90%
of all accidents are caused by driver error

1,700+
people died in vehicle collisions in the UK in 2013

Road traffic injuries are the leading cause of death among young people, aged 15–29 years

2,500
lives saved in the UK by 2030

£2,767
average cost claimed for car insurance

£11,292
average cost claimed for bodily injury

£16bn
annual cost to GB econonmy

46% 17-30 year olds do not hold a full driving licence

BAE SYSTEMS

brl
Bristol Robotics Laboratory

VENTURER

First

ATKINS

WILLIAMS

Testing technology plus a focus on legal and insurance implications

Milton Keynes – UK Autodrive

UNIVERSITY OF OXFORD

UNIVERSITY OF CAMBRIDGE

ARUP

JAGUAR

LAND ROVER

Ford

TATA MOTORS

Vehicle Technologies and looking at integrating vehicles into urban environments

flourish

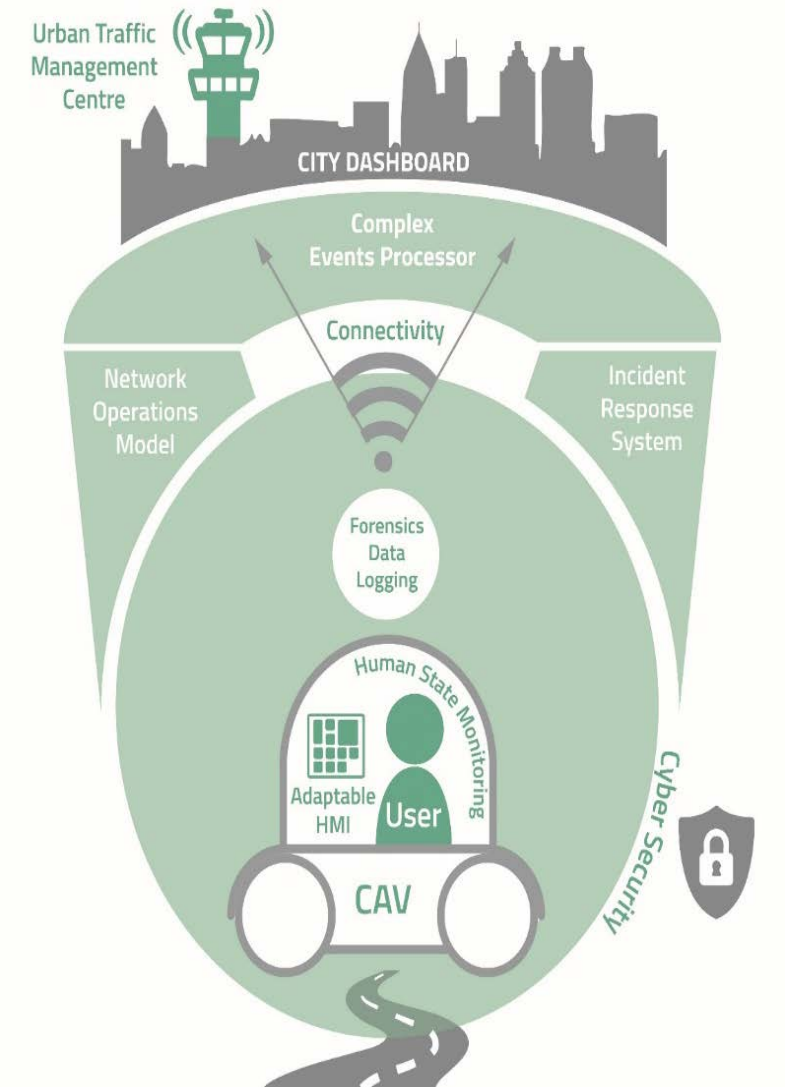
empowerment through trusted secure mobility

1. To develop an understanding and articulation of user needs and expectations of CAVs in order to maximise the mobility potential they pose.

2. To develop usable adaptive interfaces, performance certification processes and products and services that enable secure, trustworthy and private technology within CAVs.

3. To capture the data created by CAVs to develop innovative new tools and products.

4. To leverage existing investment to expand validation and test capabilities in both urban and interurban networked environments and enhance the commercial opportunities this will deliver.



CAPRI - Connected & Autonomous POD on-Road Implementation

- ***Project will trial POD mobility service at Queen Elizabeth Olympic Park***
- ***Pilot could pave the way for the use of autonomous and connected vehicles in airports, hospitals, business parks and shopping centres***

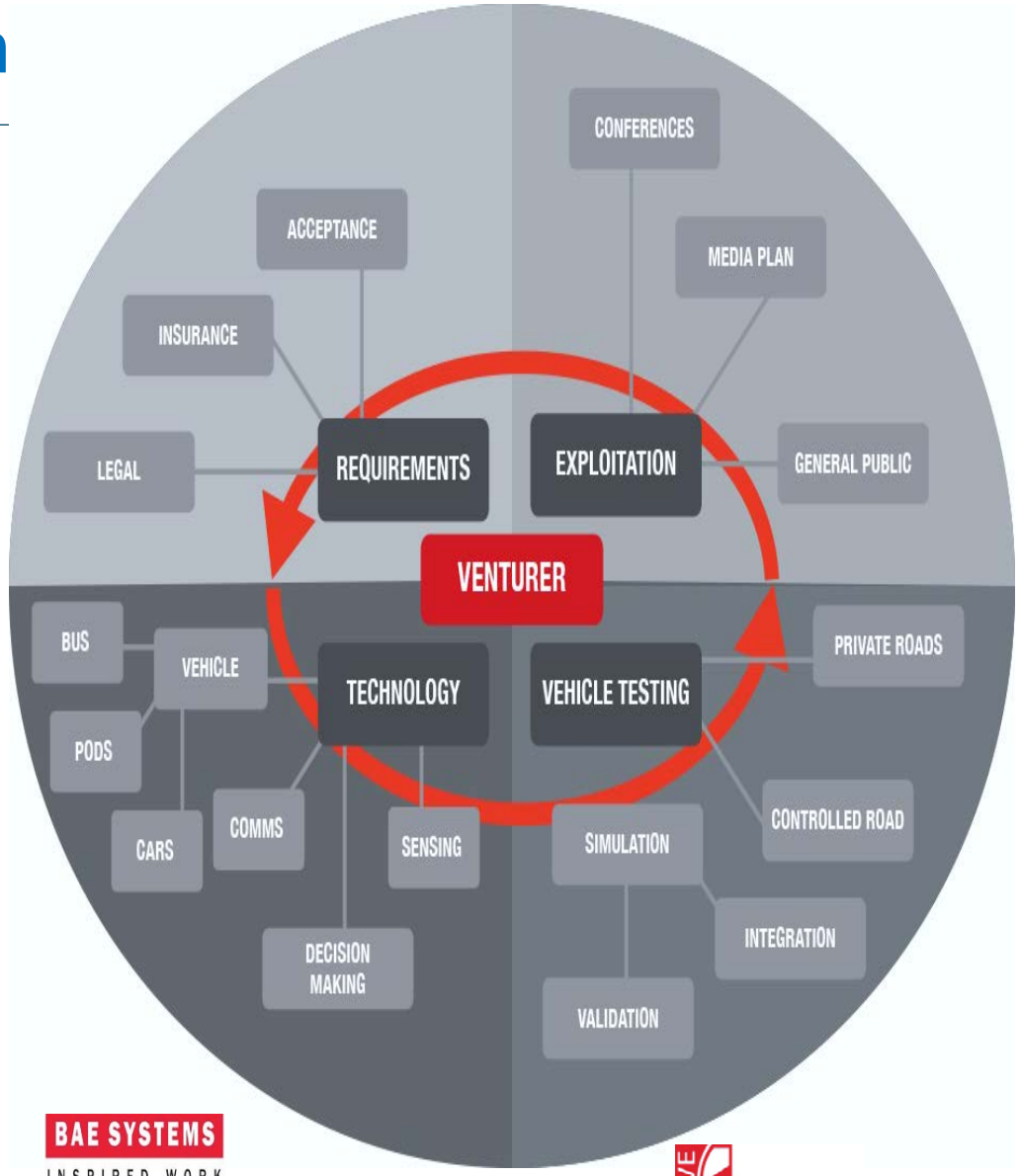
- **About CAPRI**
- CAPRI (Connected & Autonomous POD on-Road Implementation) is a large consortium comprising 20 partnering organisations. With a strong mix of academia, business and public sector authorities, each member will play an important role in the delivery of the CAPRI mobility service pilot scheme. The 20 CAPRI partners are: AECOM, AXA, Burges Salmon, Conigital, dynniq, ESP Group, Fusion Processing, Heathrow, Loughborough University, NEXOR, Queen Elizabeth Olympic Park, South Gloucestershire Council, Transport Simulation Systems, University of Warwick, University of Bristol, thingful, TVS, University of the West of England, Westfield and YTL.

Back to Bristol & Venturer….

https://youtu.be/k1JRmMA7NqU

Venturer Approach

- Research on actual impacts
- Public policy regulation & liability
- Road & traffic scenarios of increasing complexity & risk in real-life situation
- Opinions & preferences of drivers, passengers, other road users
- Technical standards and regulations
- Vehicle technology linked to required infrastructure adaptations
- Other in-vehicle services (e.g. infotainment) and owner/user models
- Bundling with low carbon and Intelligent Mobility to deliver multiple benefits within Smart City framework



Our Project Prospectus - The 4 ‘T’s!

Trust, Transport, Testing & Timing

Trust

People must believe and trust the technology they are using. They must feel safe and want to use/buy new services that CAV open up to them rather than being sold solutions that are not fit for purpose or for person. CAV must be safe, secure and valued by the consumer and understanding the behaviour and emotions around CAV is an important step towards deployment.

1. Overall, consumers are skeptical about driverless cars:

nerdwallet

76% Would not put a child into a driverless car for a trip alone

50% would not pay extra for a driverless car

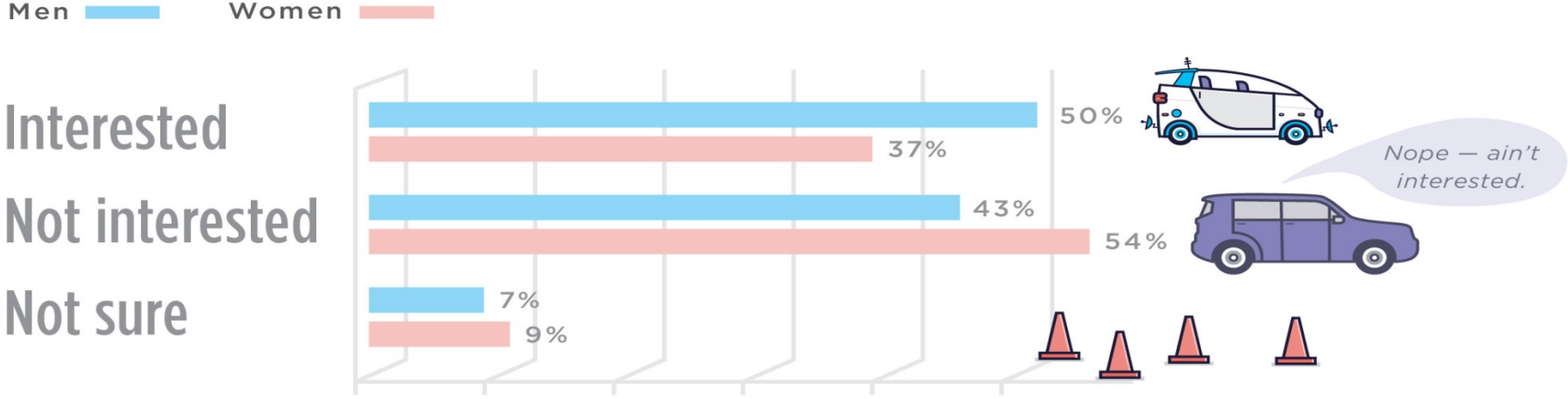
49% Are not interested in owning a driverless car

46% Think driverless cars will not be safe

36% Say nothing appeals to them about a driverless car

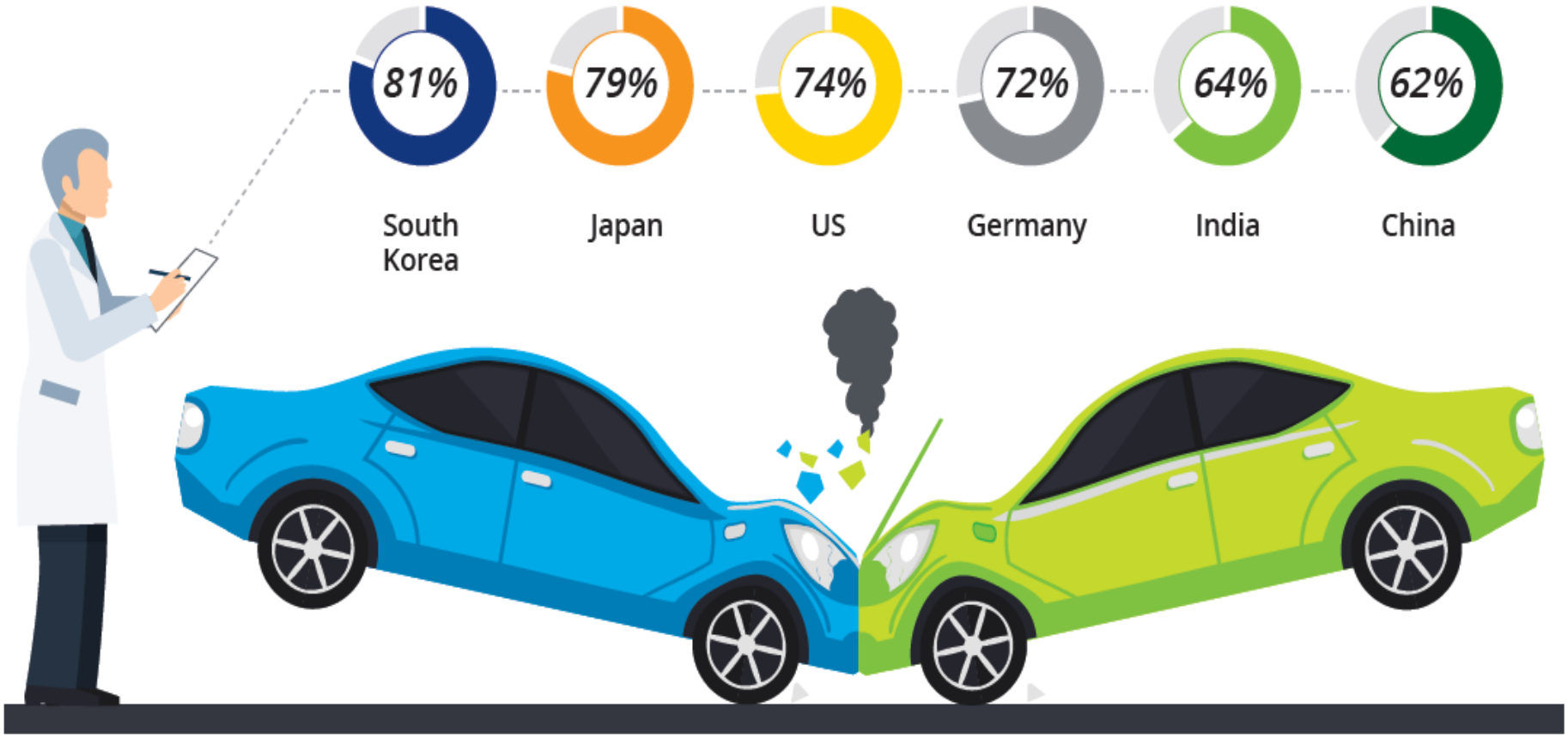
2. Interest in owning a driverless car:

nerdwallet



Trust?

Percentage of consumers who feel full self-driving vehicles will not be safe



Source: Deloitte Global Automotive Consumer Study

Public Perception

The 4 ‘T’s!

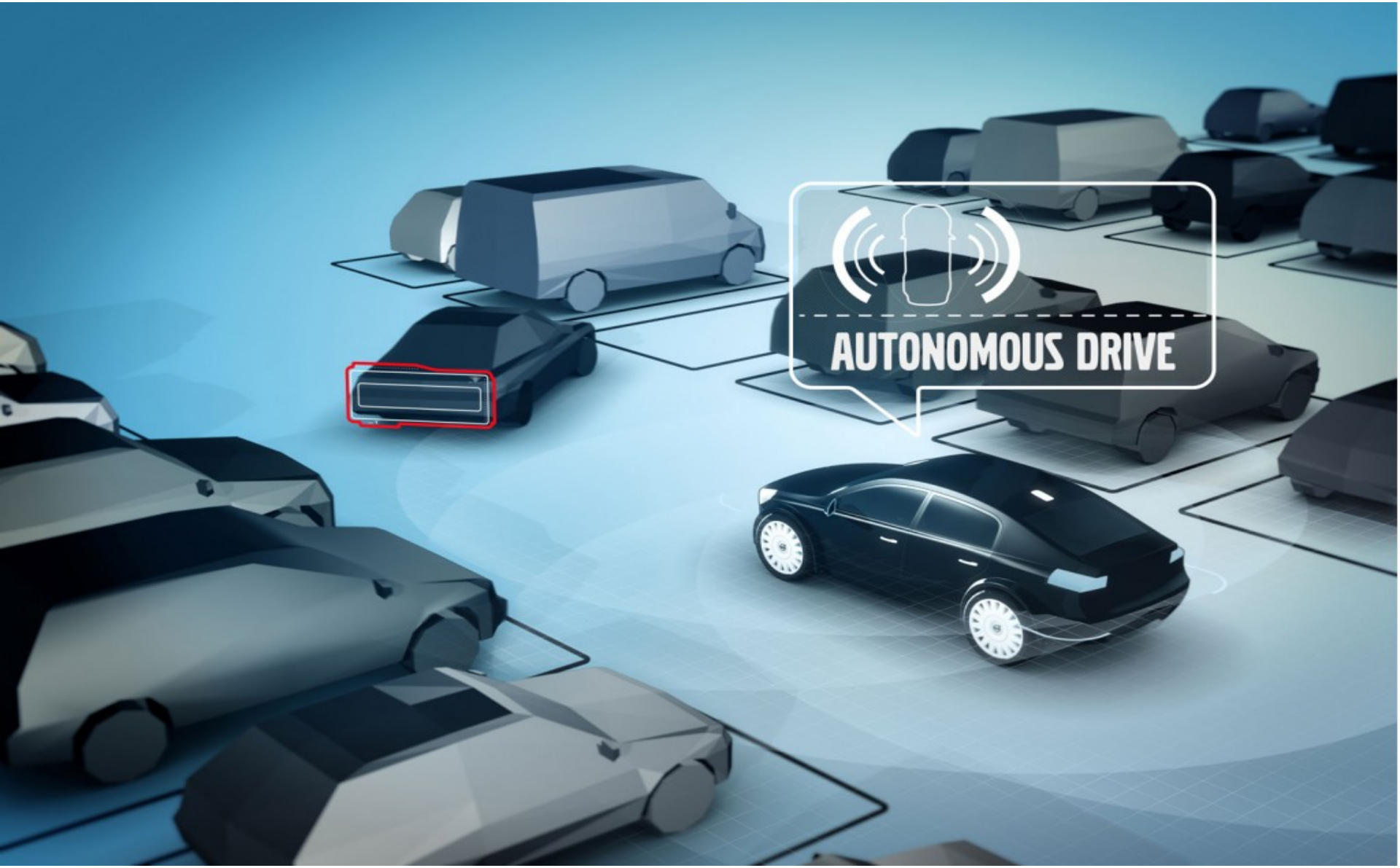
Transport

The deployment of CAV capability has considerable ramifications on the wider transport sector and cities/communities in general. Key questions that must be addressed relate to the infrastructure investment needed, the data intelligence that can be garnered for a transport operator, and how CAV is one piece of the Smart City puzzle.

Bristol is Open!

www.bristolisopen.com

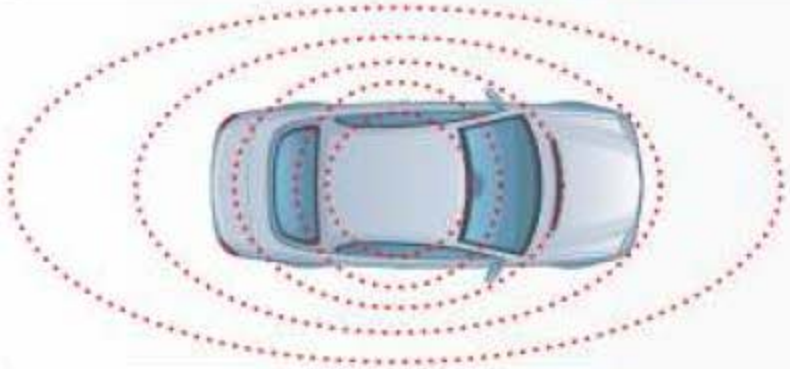
Transport – Integrated Solutions?



Need Conectivity as well as Autonomy!

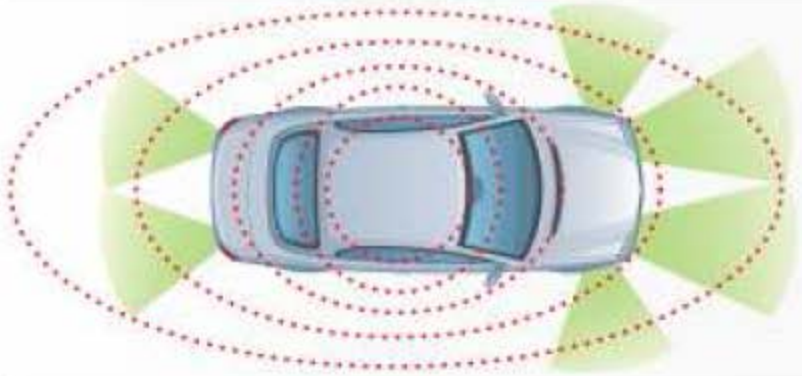
Sensor-Based Solution Only

- Cannot sufficiently mimic human senses
- Not cost-effective for mass market adoption
- Lack of adequate 360° mapping of environment in urban grids



Connected Vehicle Solution Only

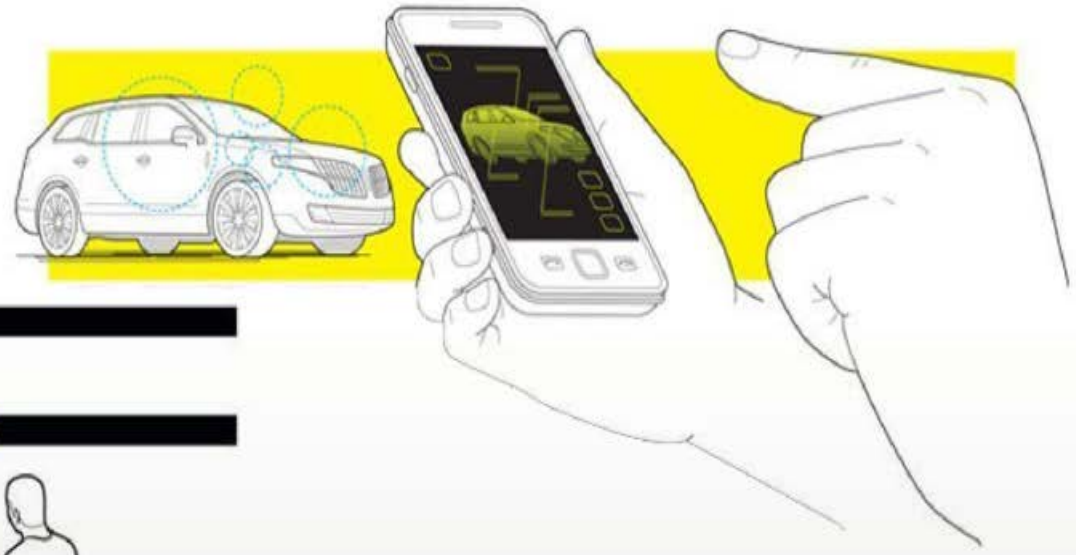
- DSRC does not currently work with pedestrians, bicyclists, etc.
- DSRC-based V2I might require significant infrastructure investment
- V2V requires high market penetration to deliver value reliably

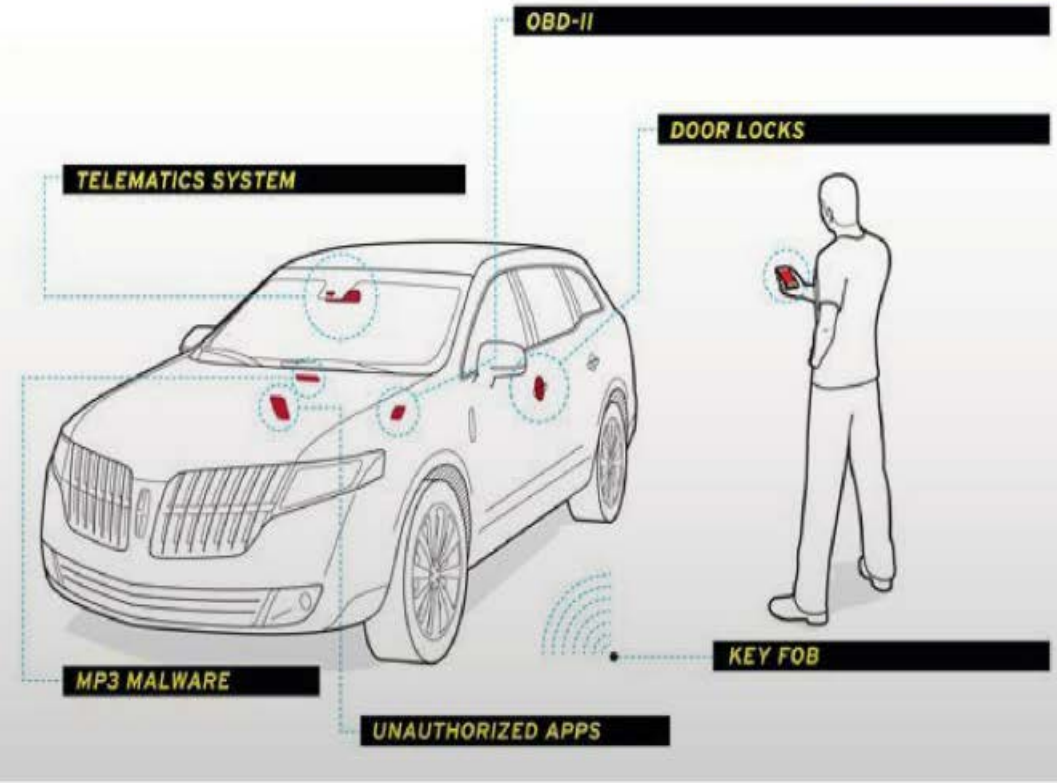


Converged Solution

- Convergence will facilitate adequate mimicking of human senses
- Convergence will reduce need for an expensive mix of sensors and reduce the need for blanket V2I investment
- Convergence will provide the necessary level of functional redundancy to ensure that the technology will work 100 percent of the time

Connectivity Brings New Risks!





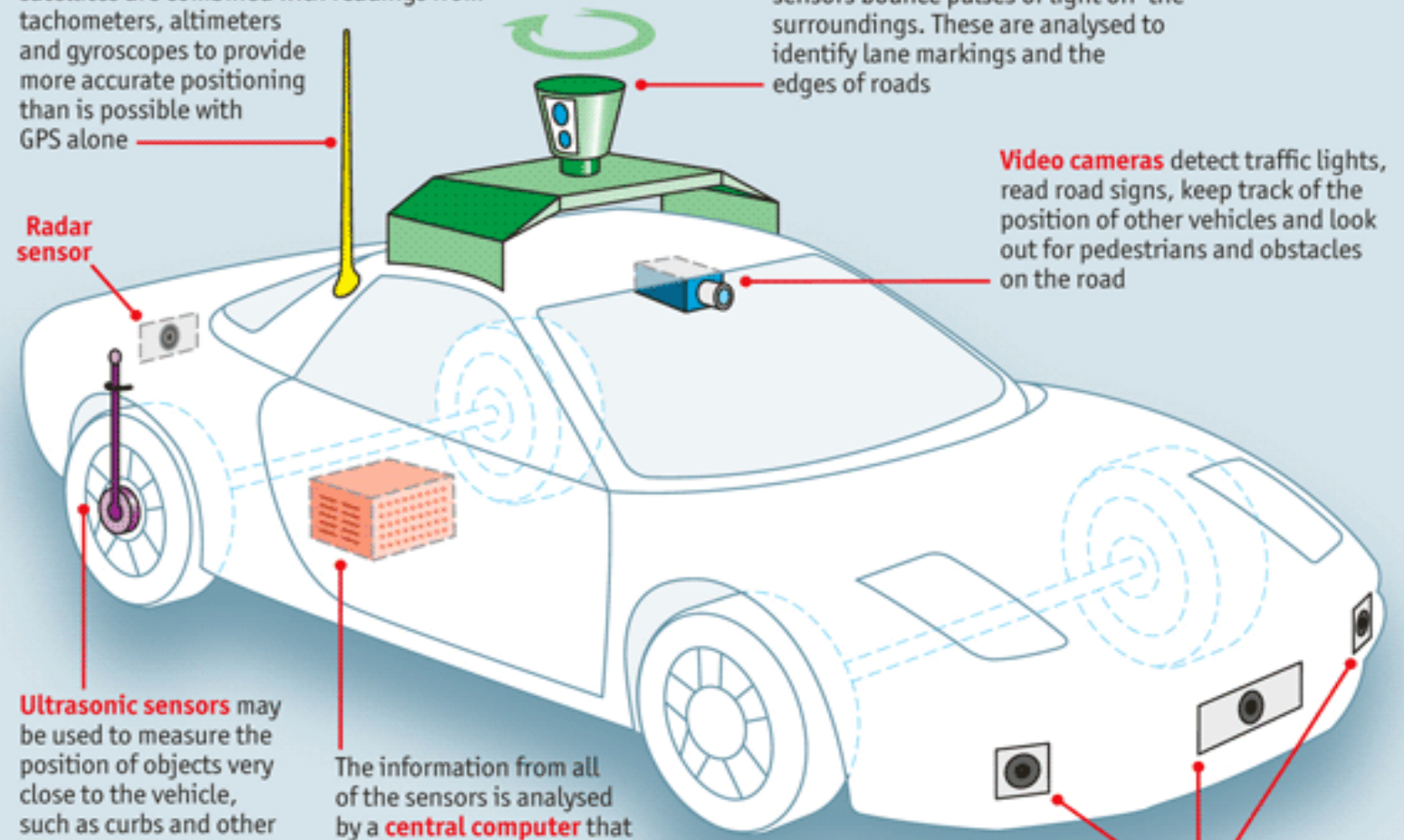
The 4 ‘T’s!

Testing

Independent validation is fundamental to emphasise the capability and safety of any solution in the CAV space. It is vital that appropriate and audited testing takes place in a controlled environment before any deployment takes place in. As the software and hardware components come from multiple vendors and integrated numerous ways, the various levels of testing required must be fully understood and integration with primary and secondary parts must be considered. The communications backbone must be robust and secure with a realistic urban backdrop. This is necessary to fully understand real life deployment issues.

Under the bonnet

How a self-driving car works



Source: *The Economist*

The 4 ‘T’s!

Time

CAV deployment is a question of ‘when’ rather than ‘if’. For the UK to create a competitive advantage it is necessary to continue to invest in this area. Significant growth potential exists as well as growing global competition. The UK must maximise the opportunities that regulation currently provides and aggressively target market growth in the areas of testing and validation.

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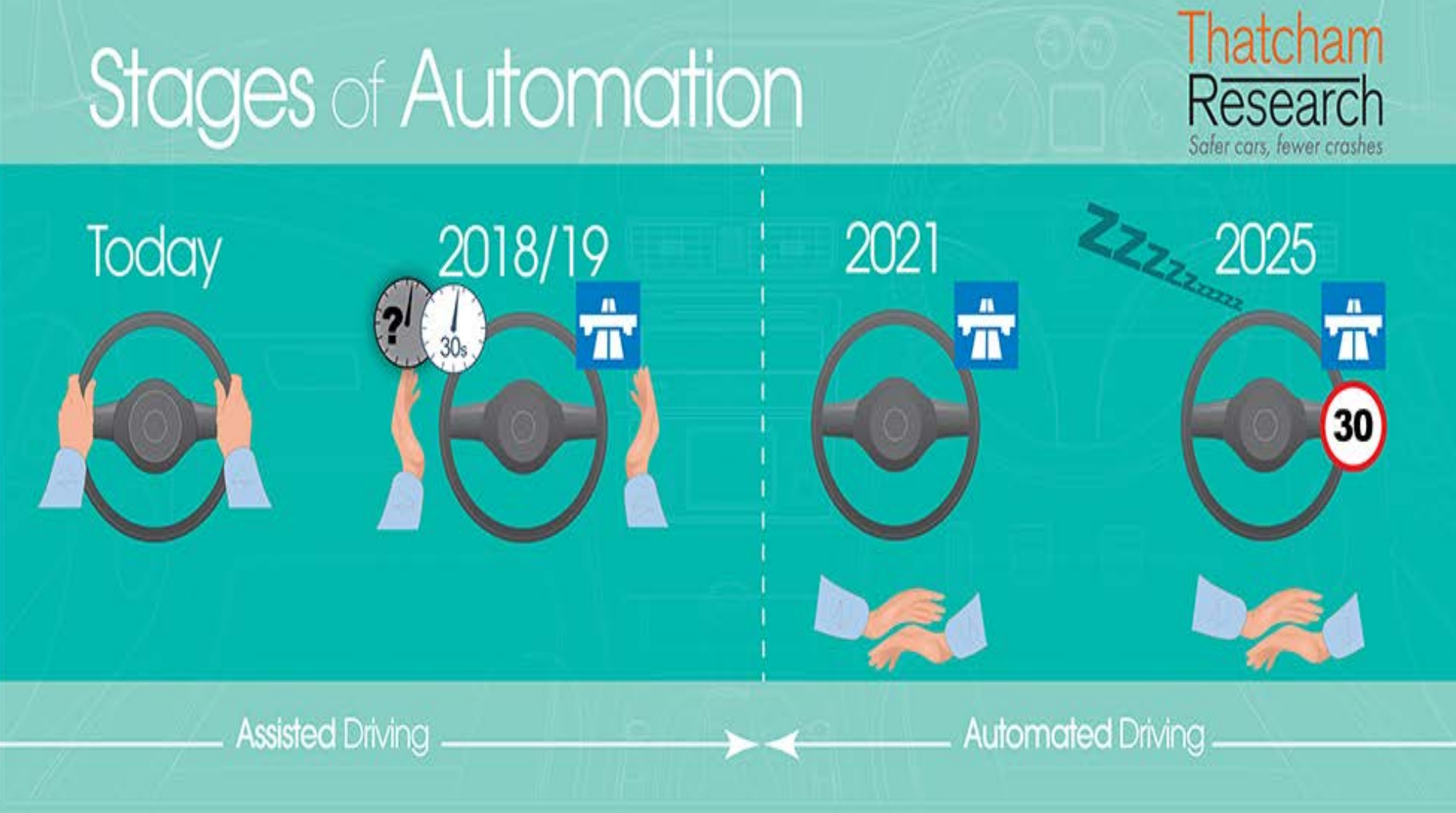
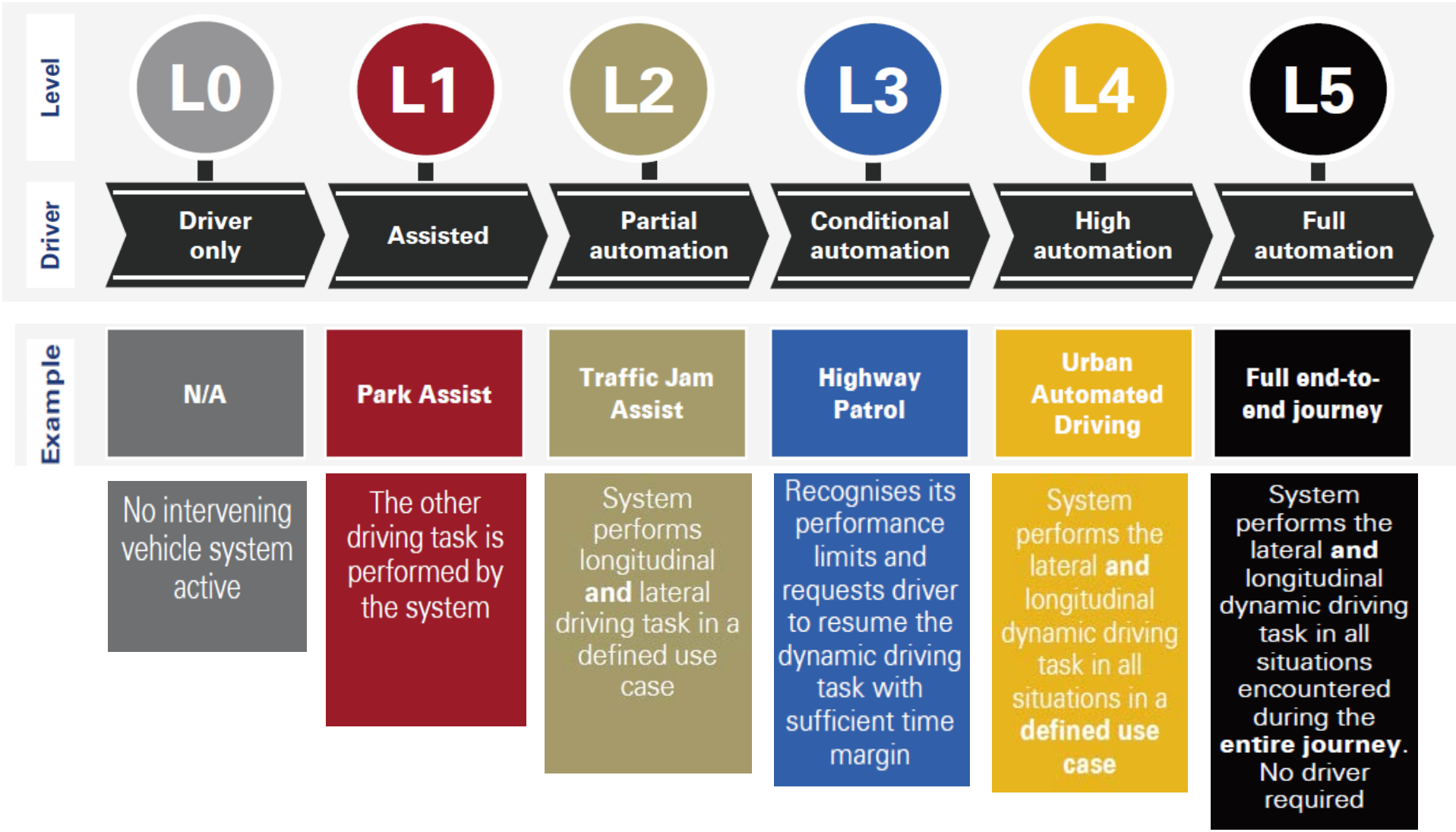


Defined Levels of Automation…

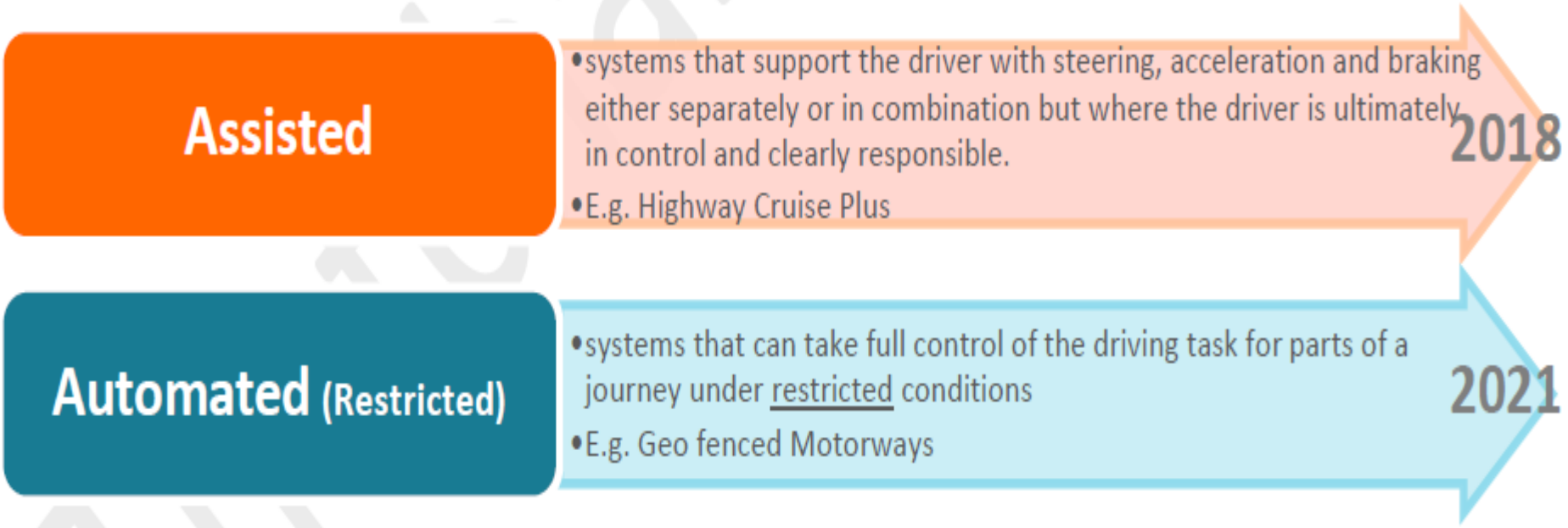


From ADAS to Automated Driving

SAE Level	0	1	2	3	4	5
	None	Assisted	Partial	Conditional	High	Full
Estimated Timeline	Current	Current	2016	2018	2021	2025
Control of steering, throttle, brakes	Driver	Driver & Vehicle	Vehicle	Vehicle	Vehicle	Vehicle
Monitoring of driving environment	Driver	Driver	Driver	Vehicle	Vehicle	Vehicle
Responsibility if driver fails to take control when requested	Driver	Driver	Driver	Driver	Vehicle	Vehicle
System capable in...	No capability	Some driving modes	Some driving modes	Some driving modes	Some driving modes	All driving modes

- Driver perception could be that vehicle is responsible...
- But vehicle is not responsible yet

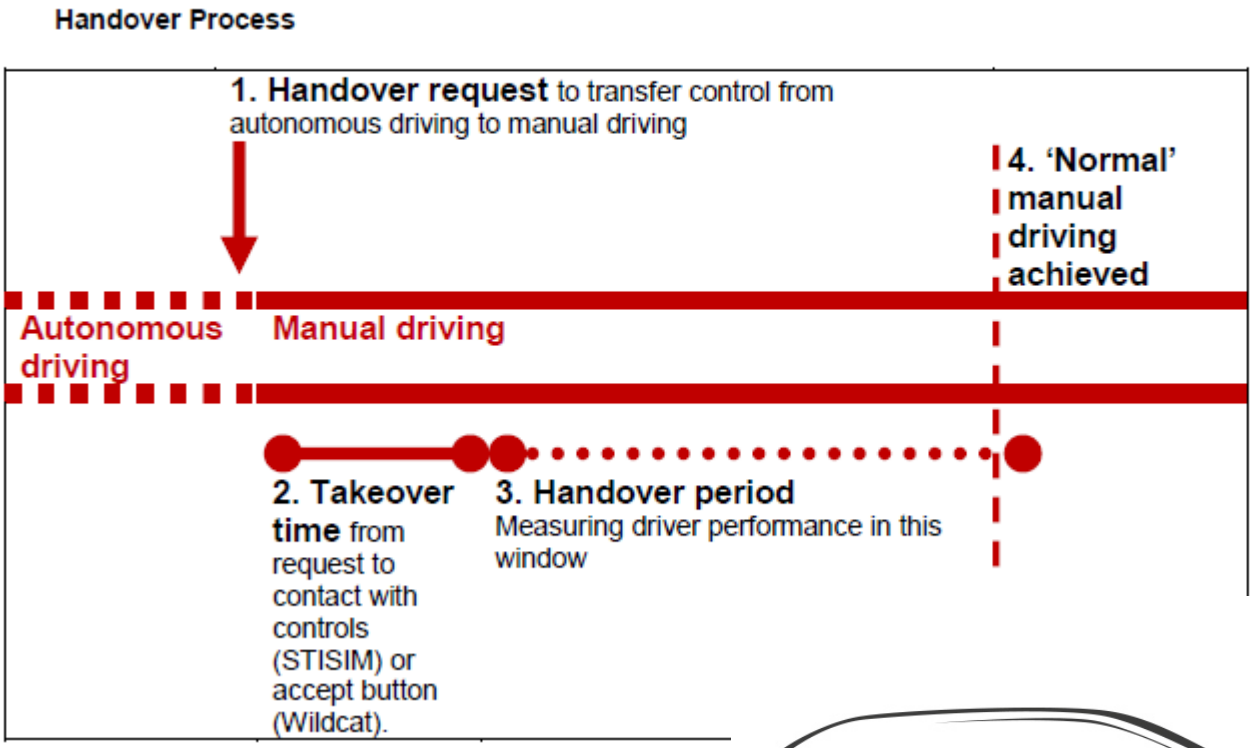
Driver Confusion = Worried Insurers!



There is great confusion around driver responsibility which must be cleared up. In reality it could be described in a simplified binary definition as above. In the fullness of time a ‘Fully Automated’ category would be added where the car can not be operated at any time by the occupants, truly driverless.

The ‘Handover’ issue!

Venturer 2015 – 2018. **Trial 1: spring summer 2016**



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Modern Transport / Vehicle Technology & Aviation Bill

Vehicle Technology and Aviation Bill

New rules to ensure safe and effective insurance for self-driving cars

Department for Transport

UK Department for Transport proposal

UK Government's policy aim:

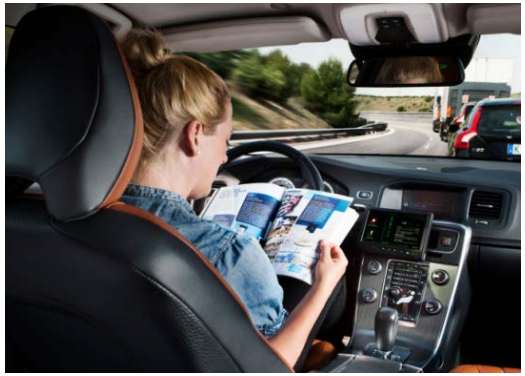
- Ensure there is compulsory insurance requirement to protect victims in collisions involving a highly automated vehicle; and
- The process for the victim to make a claim is not significantly different from claims arising from conventional crashes.

Their proposed solution:

- Don't change the civil liability regime;
- First route for the victim is via the driver/policy holder of the highly automated vehicle
- but… ***require that the owner has legal responsibility for making sure there is in place an insurance policy that includes cover for the manufacturer's and any other entities' liability***.

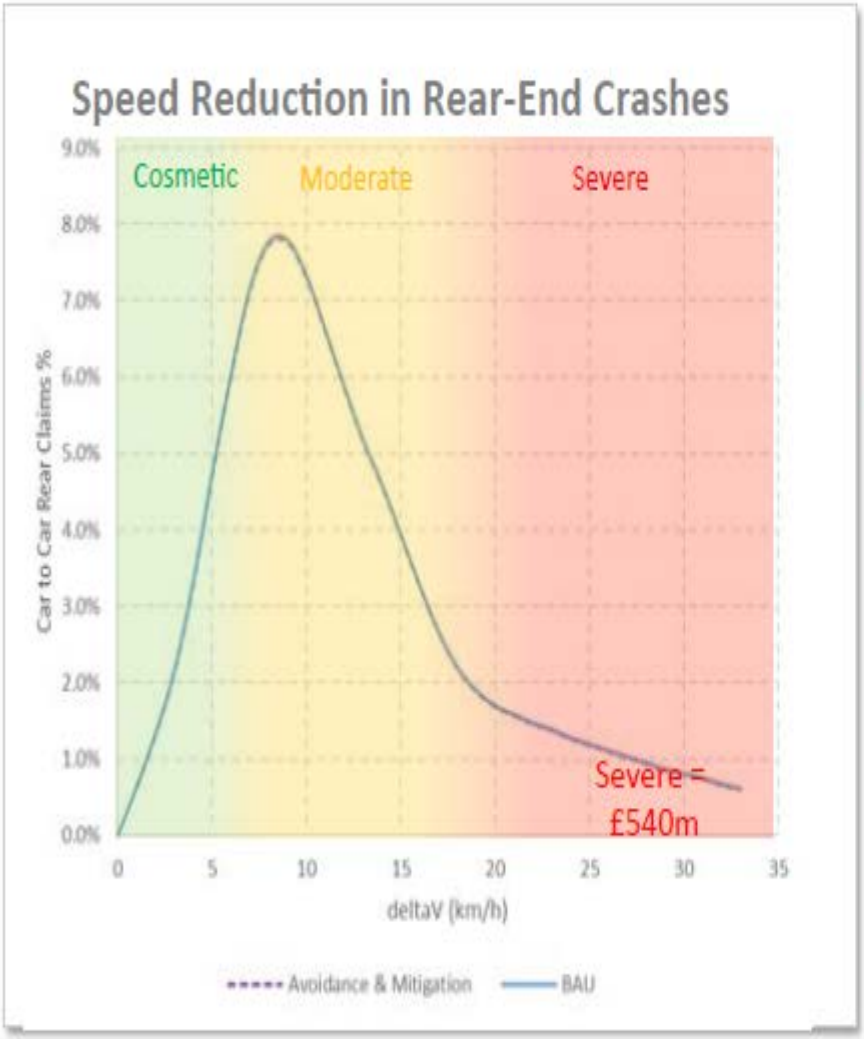
How will the new system work?

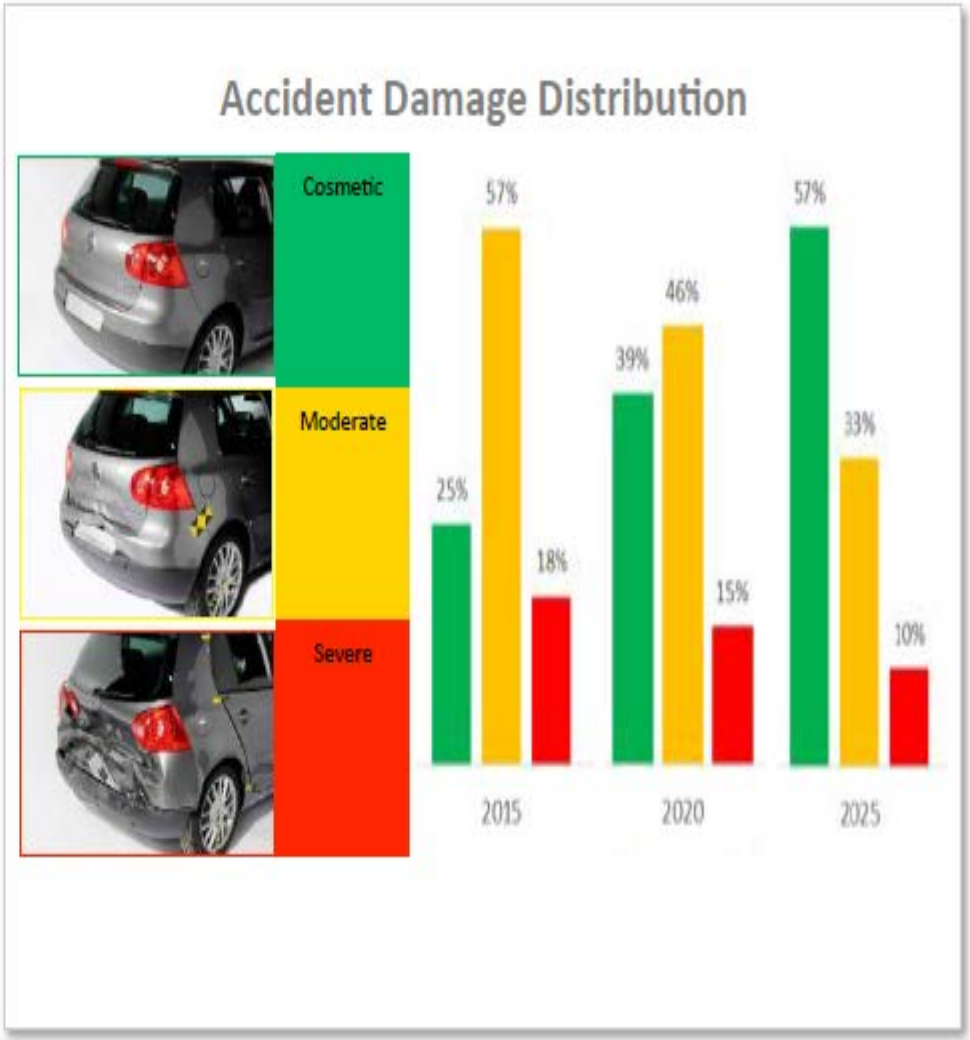
- Drivers should continue to buy a single motor insurance policy to cover both manual and automated driving (drivers WON'T need to buy separate Product Liability cover).
- Insurers should have a new legal right to recovery, allowing them to get costs back from motor manufacturers, software companies or other parties in cases where the vehicle or technology was found to have been at fault.
- Strict rules on what people can and cannot do behind the wheel need to be maintained and drivers will need absolute certainty about when they can safely allow the car to drive autonomously.
- This will need to be underpinned by consistent rules on data recording and accessibility. To settle claims fairly and efficiently, insurers will need to know if the car was in automated mode and, if so, if those functions were being operated correctly.



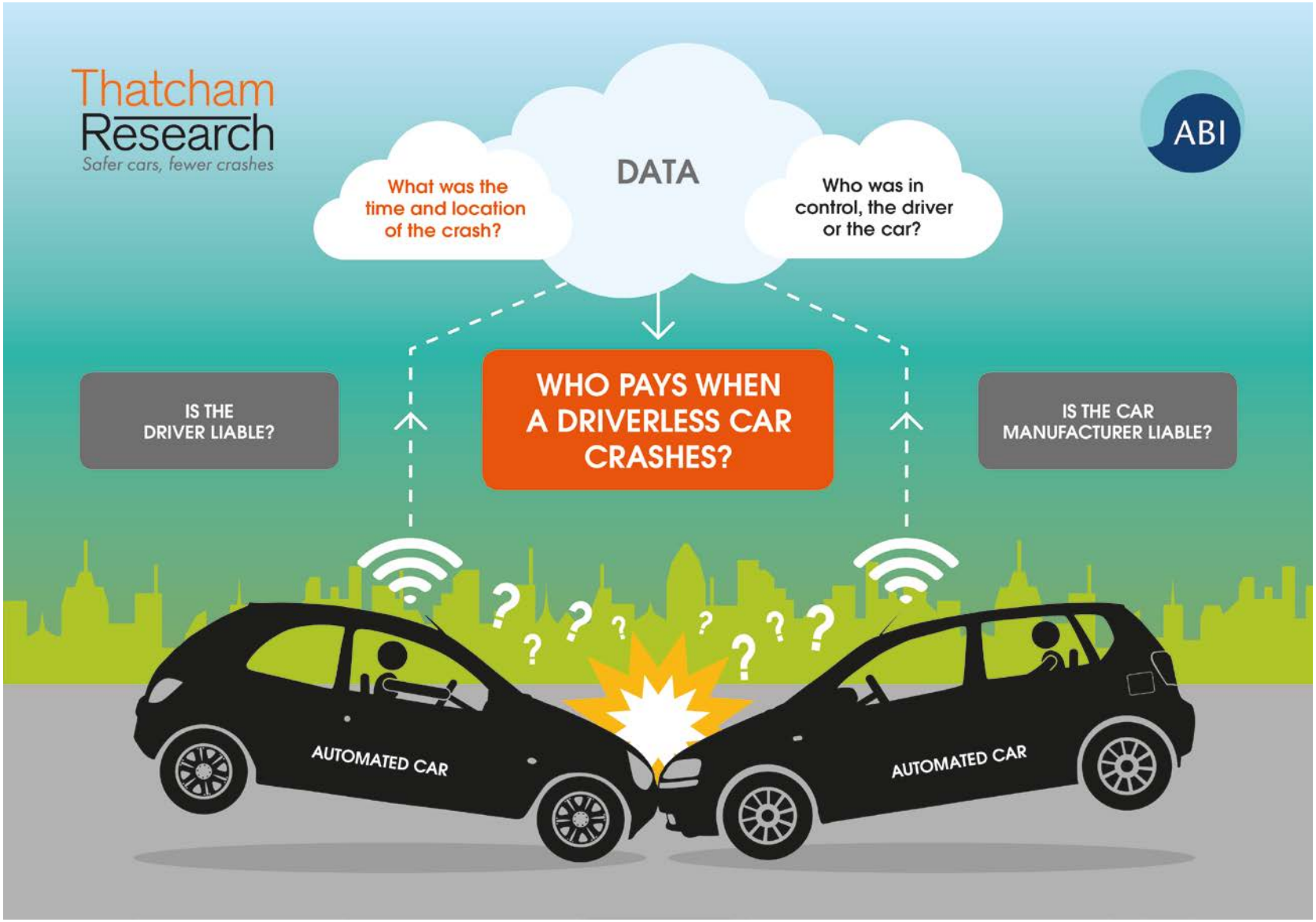
Insurance needs & produces data

Ten Year Prediction of Crash Severity



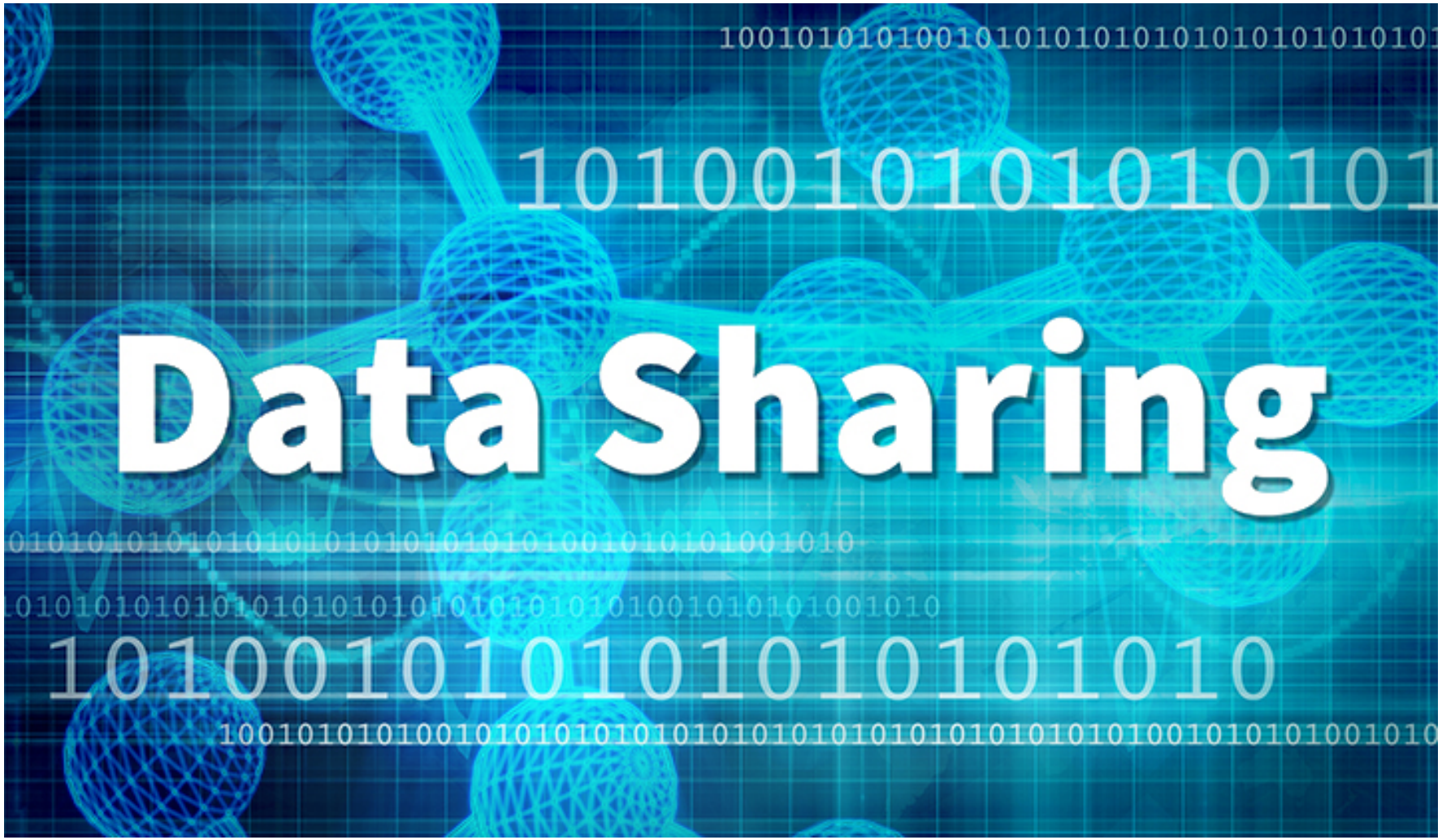


The Big Question - Who Pays?



Vehicle Technology & Aviation Bill

What is missing?



Insurers make call for international data standards

“Driverless cars must share crash data if something goes wrong”

- Cars of the future will need to collect a basic set of core data to prevent drivers being unfairly blamed if technology goes wrong,
- British insurers are leading efforts to have a standard set of data agreed at an international level which would be easily available in the event of an accident involving a highly automated vehicle.
- This would include an indication of whether the vehicle was operating autonomously or not, and what technology was in use.

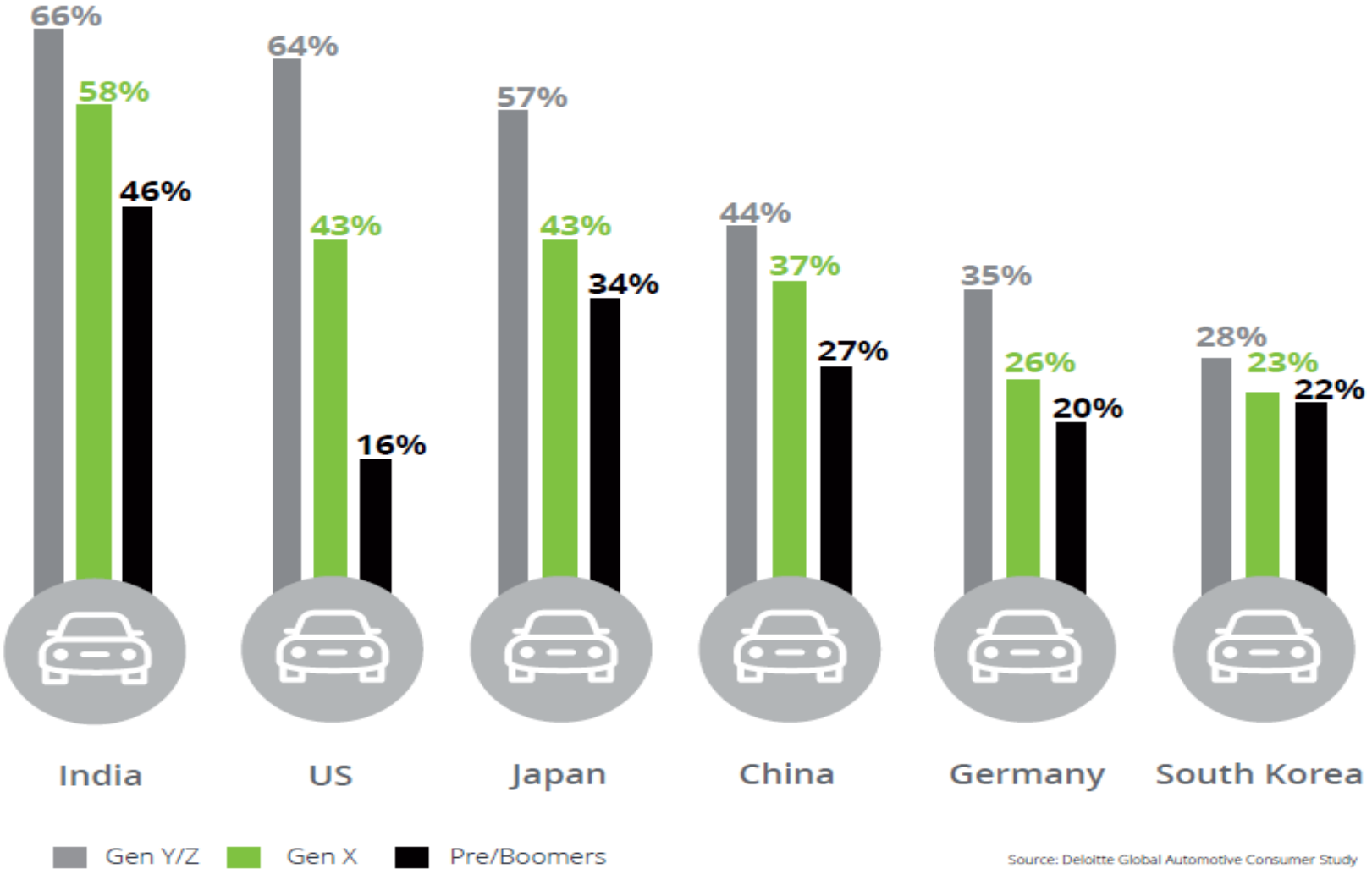
- This information would be used to:
  - → establish liability for anything that had gone wrong
  - → inform emergency services’ investigations
  - → ensure insurance claims could be processed promptly
  - → help vehicle manufacturers improve their products

AXA Report on Commercial Vehicle Impact

Estimated Savings over 10 years

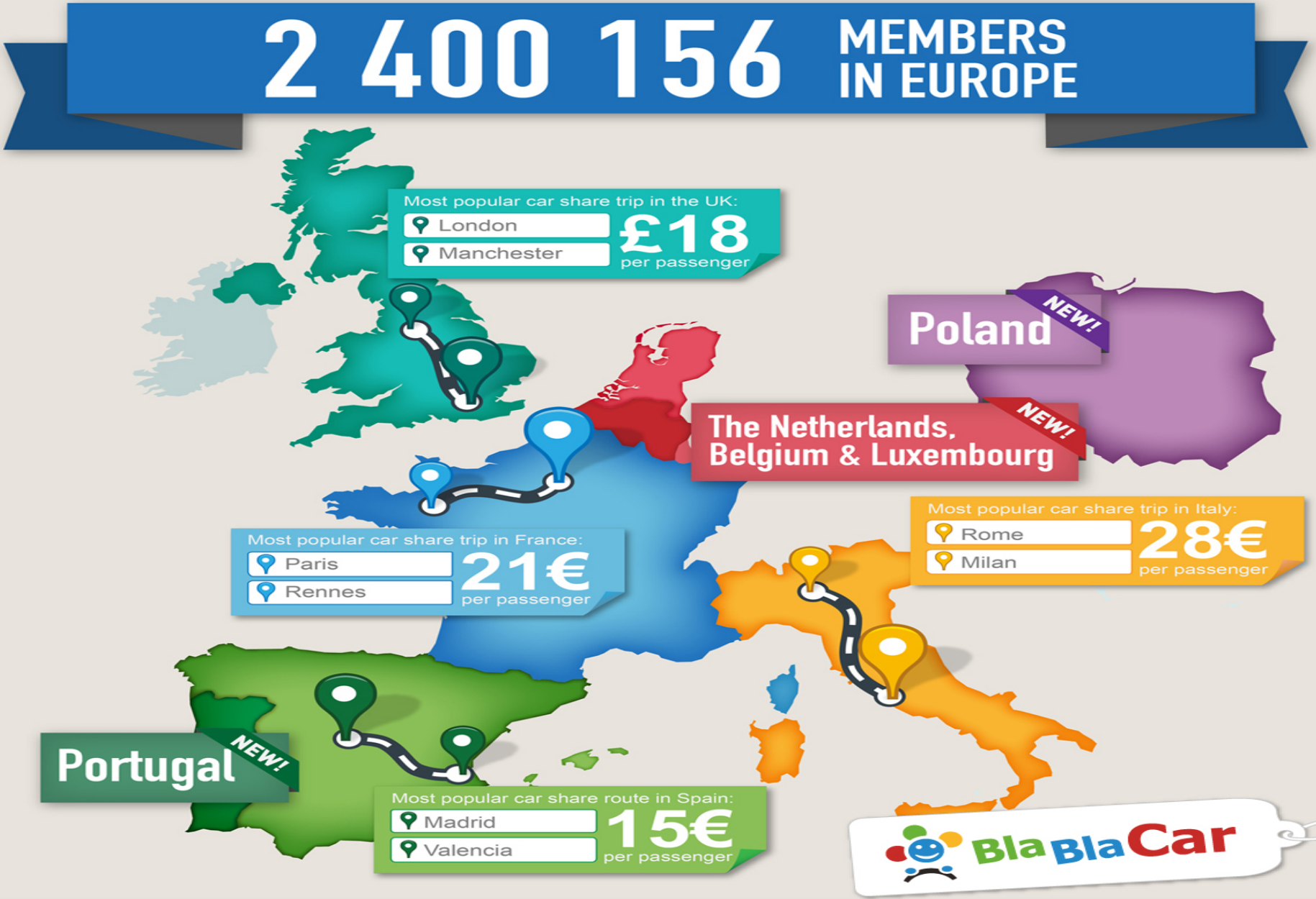
The Uber Effect?

Percentage of consumers who use ride-hailing services that question whether they need to own a vehicle in the future, by generation

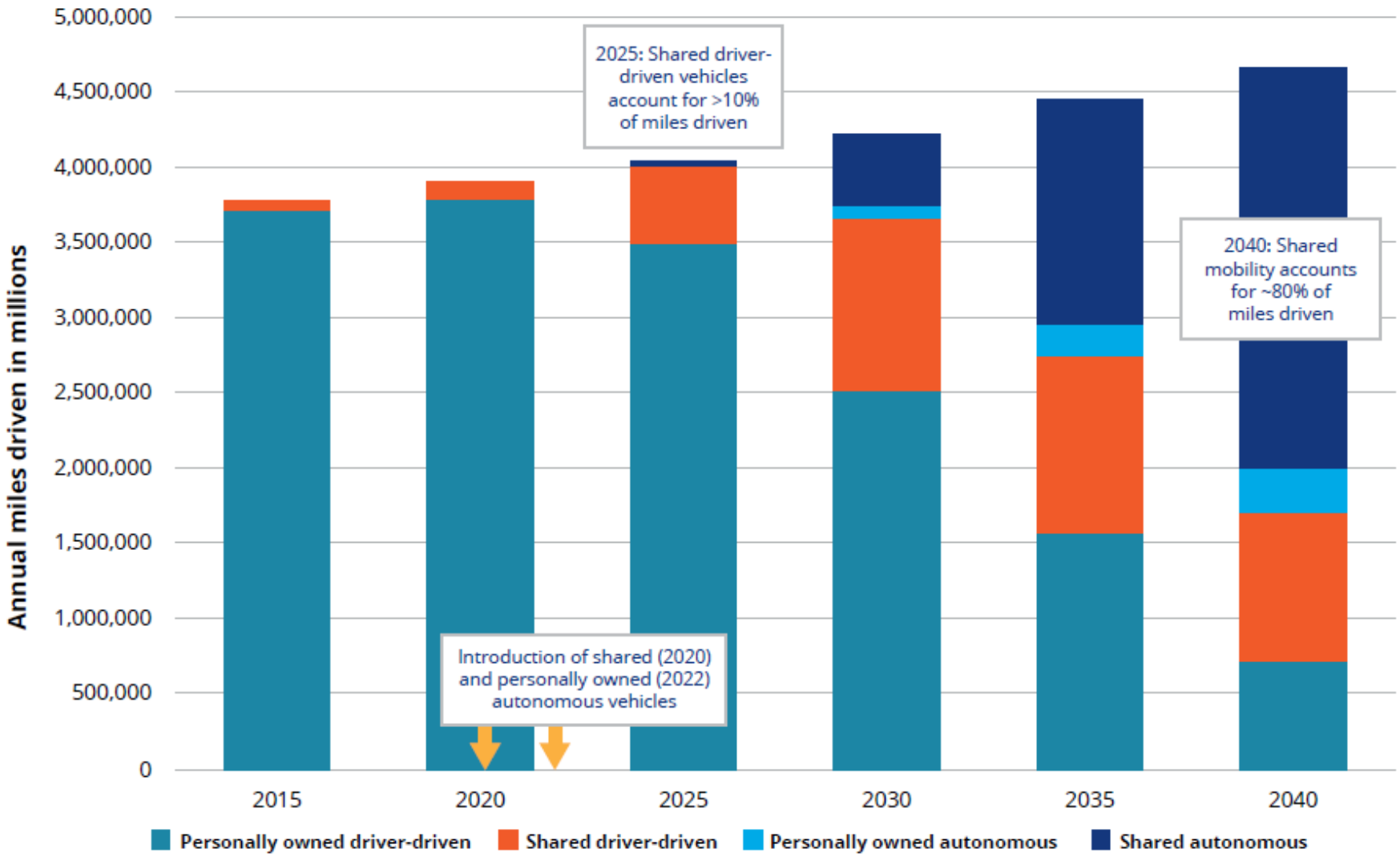


Source: Deloitte Global Automotive Consumer Study

Sharing Society



Forecast of Changes to total Miles Driven (source – Deloittes)

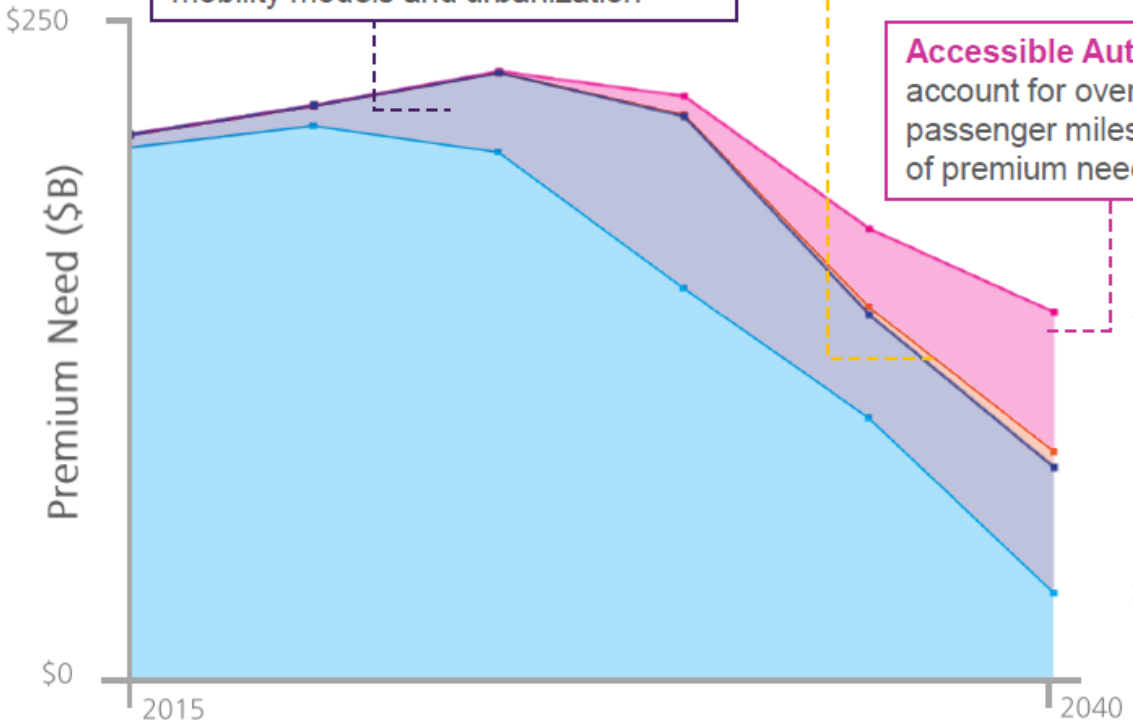


The premium mix will move away from traditional auto policies and decline overall

A World of Carsharing emerges in the mid-2020's as a significant market segment due to emergence of new mobility models and urbanization

The Driverless Revolution does not project to be a significant portion of the total market in the near future

Accessible Autonomy will account for over 60% of passenger miles and 25% of premium need by 2040



Innovator View:

As much as 80% of premium need in the future will be for new models of insurance

1 **Incremental Change**
2 **A World of Carsharing**
3 **The Driverless Revolution**
4 **Accessible Autonomy**

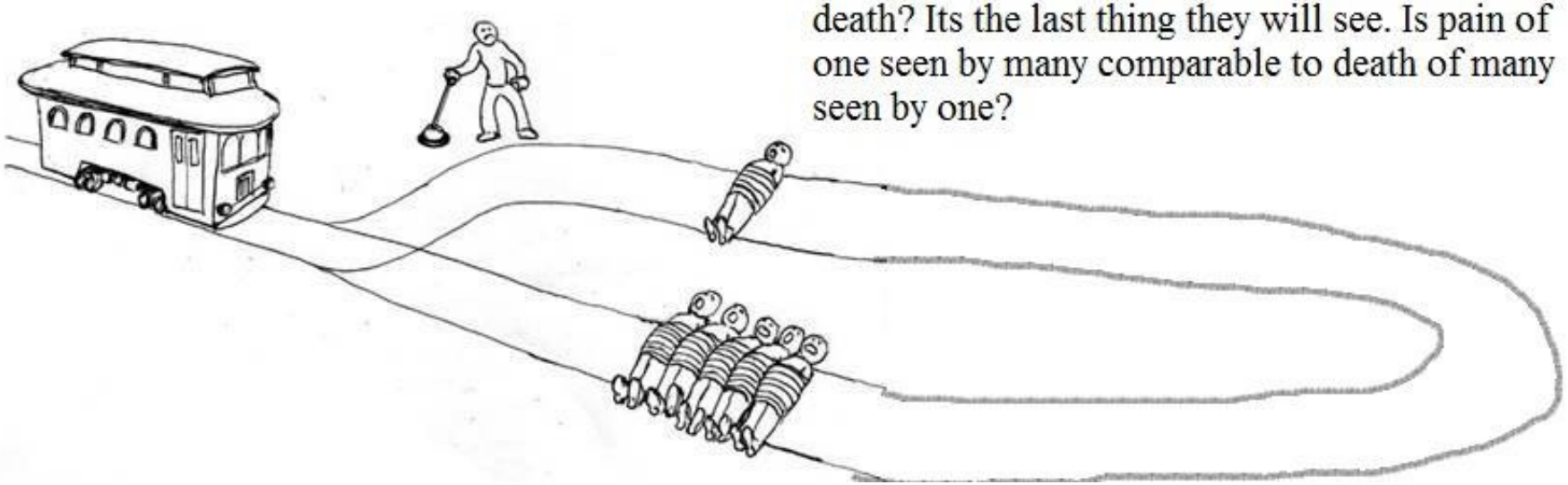
Source: Deloitte analysis

Note: *This model was developed by Deloitte's actuarial practice and is based on assumptions around distribution of passenger miles, frequency, and severity of loss events in each Future State*

Deloitte.

Social & Moral Perspectives?

The Trolley Dilemma



What would be more ethical? Killing one person in front of 5 people before they die or killing 5 people in front of 1 person before his death? Its the last thing they will see. Is pain of one seen by many comparable to death of many seen by one?

Not *if* but *when!*

We now have the legal Framework

- “Automated vehicles have the potential to transform our roads in the future and make them even safer and easier to use, as well as promising new mobility for those who cannot drive.
- We must ensure the public is protected in the event of an incident and today we are introducing the framework to allow insurance for these new technologies.” – Chris Grayling @transportgovuk

- “We think this legislation is a positive step forward that provides clarity to insurers to ensure we design our products appropriately. It keeps protection of the general public at its heart which we hope will encourage early adoption of some really impressive technology.
- The vast majority of accidents are caused by human error and we see autonomous vehicles having a massive impact, reducing the number and severity of accidents. As well as making our roads safer, Insurance premiums are based on the cost of claims and therefore we expect substantially reduced premiums to follow” - @AxaDavidW

Thankyou for Listening