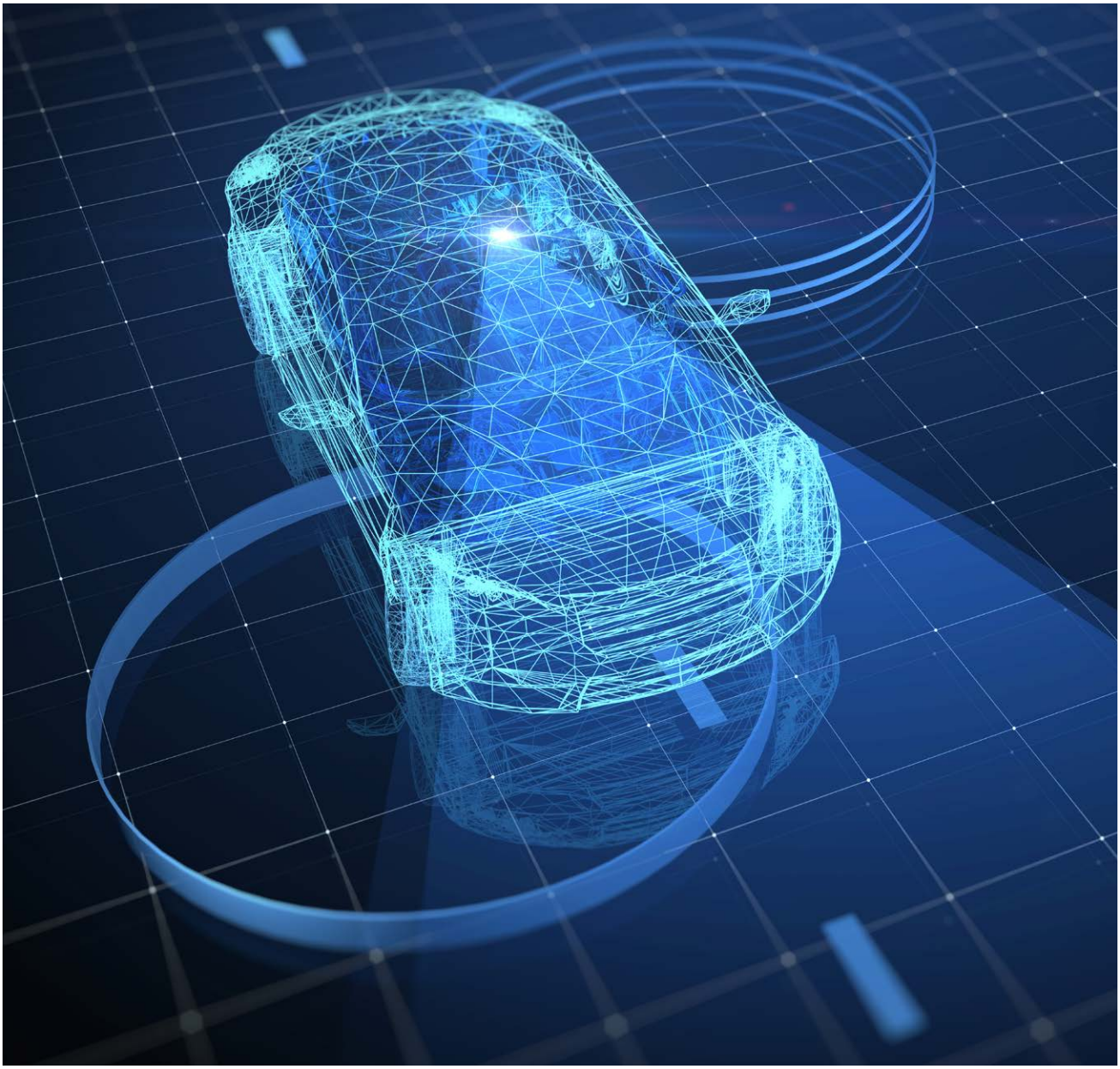
MARSH

Taking Shape – Technology in Transportation



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INTRODUCTION

Intelligent and connected systems are transforming transportation at a dramatic rate. With the promise of significant economic and social benefits, governments are working to remove technical and policy barriers to ensure widespread adoption, which has consequently begun to shift established business models. However, consideration needs to be given to the risks involved in this technological revolution and how should they be responded to.

The UK is facing many difficulties in terms of how it gets people to work and goods to market. Transport operators too are struggling to meet the needs of their customers in an ever-competitive environment. On-demand delivery, reducing budgets, and increased operational costs make a race for all to do more for less.

The combining of connected and autonomous technologies within vehicles is expected to bring about numerous advantages, including:

- **Safer journeys**
  Human error is a factor in more than 90% of collisions; removing the human aspect of driving is expected to dramatically reduce fatal and serious injury accidents.
- **More efficient journeys**
  Computer-driven vehicles will "understand" how to respond to the conditions of the road ahead and undertake re-routing based on live traffic updates.
- **Greater accessibility**
  Transport will cease to be age or health dependent, which will result in an increase in mobility across the whole population.
- **Reduced congestion**
  Vehicles will be able to drive closer together, which will reduce emissions at a crucial time of increasing road usage.
- **Insight through data**
  Data gathered through on-board systems can provide insights as to driving patterns, vehicle condition, and idle times, and can measure fuel consumption.

Although connected and autonomous vehicles will still, for the foreseeable future, require the driver to be in control at all times, vehicles are expected to eventually allow drivers to utilise their time in a different way, heralding a new era of travel.

SHIFTING SANDS – FROM TRANSPORT TO JOURNEY[1]

1,730
fatalities in vehicle collisions in the UK in 2015.

22,144
seriously injured in vehicle collisions in 2015.

90%
of all accidents are due to driver error.

By 2030, connected and autonomous vehicles could save ~ 2,500 lives and prevent more than 25,000 serious accidents in the UK.

Autonomous emergency braking (AEB) has been shown to reduce third-party injuries by up to 45%.

31%
of women and 14% of men do not hold a full licence.

46%
of 17 to 30 year olds do not hold a full licence.

30%
of traffic congestion in urban centres is the result of drivers' looking for parking.

OPPORTUNITIES FOR TRANSPORTATION COMPANIES

As autonomous technology evolves, companies that rely on vehicles to move goods will witness reduced demands on drivers, as hours, age, and disability become less significant. They may even eventually look to increase efficiency by removing drivers from trucks altogether.

Many current production vehicles already feature advanced driver assistance systems (ADAS), features such as adaptive cruise control and lane-keeping technologies, which allow the automated control of acceleration, braking, and steering for periods of time on motorways and also in congested traffic.

Advanced emergency braking systems automatically apply the brakes to help drivers avoid a collision, while self-parking systems allow a vehicle to parallel or reverse park hands free.

Companies who own and operate fleets will therefore benefit from increased efficiencies and lower costs through fuel savings and fewer claims. As the vehicle moves to full autonomy, utilisation rates will increase, as operators will be able to operate 24 hours a day, seven days a week, which could prove particularly important at a time of driver shortages across the logistics industry.

NEW EXPOSURE RISKS TO BE CONSIDERED

While the progressive adoption of autonomous technologies is expected to reduce some existing costly liability exposures, new ones will be presented. As autonomous vehicles move out of the research and testing environments and into general road usage, insurance coverage will likely be impacted, particularly liability coverage. As control of the vehicle gradually moves from manual operator–controlled to automatic computer–controlled, the distribution of liability is expected to shift. Uncertainties will, however, remain as to how autonomous vehicles will perform in a mix of manually-operated vehicles. As the use of autonomous vehicles increases then, the most commonly asked question will be as to take up fault it would be if there was a collision.

Would it be the fault of:

- Vehicle drivers?
- Vehicle owners?
- Vehicle operators?
- Vehicle manufacturers?
- Vehicle suppliers/importers?
- Service providers?
- Data providers?

The apportionment of liability may depend on the amount of control permitted to the driver: The more autonomous the vehicle, the greater exposure for the manufacturer. In the event of a collision where the parties are unable to resolve where liability lies, this process would probably take place in a court of law[2].

SPOTLIGHT

Deriving value from big data

The connected vehicle allows for a myriad of data to be collected and distilled. Data gathered through on-board systems can provide insights as to driving patterns, vehicle condition, and idle times, and fuel consumption, all enabling better fleet management.

Adapting to an era of data-driven decision making is not always simple. The challenge is in developing the correct business processes to realise the full potential of data collected. The connected vehicle will push this agenda further, as historical claims history will become less relevant and predictive modelling will take centre stage, utilising real-time data to look into the future as technology progresses.

Benchmarking has become standard and with it a commodity process of using aggregate data. To unveil worthwhile information, benchmarking must take place between as-near-identical comparator groups as can be identified. The similarity of starting conditions allows the identification of effective changes, which will provide rewards when replicated.

An easy gain often overlooked in establishing a benchmark is the baseline. To establish the benchmark the baseline must first be set. This will entail not just scheduling the list of the fleet, but fully identifying all the active and passive features that have been added to improve safety and the nature of operations. In completing this, the question has to be asked, does my telemetry provider understand the current baseline and the way it is modified and upgraded?

LIABILITY ACCEPTED?

Over time, there will likely be a move towards manufacturers, both technology and auto, having to accept greater liability, as the vehicles they produce become more sophisticated and increasingly autonomous. As vehicles move to level four in the automation scale, liability for an incident may well move much more towards the software provider, since greater responsibility for operation will sit with the manufacturer rather than the operator. With the potential for several parties to be held responsible in the event of an accident, legislators may be seen to be playing catch up in an environment where technological advances will quicken.

Volvo, Google, and Mercedes-Benz have all said they will accept full liability if their self-driving vehicles cause a collision. When Volvo announced that it will accept full liability for accidents involving its driverless cars, its CEO believed that it was a way to expedite regulation in the US, where "a patchwork" of rules is currently holding back the industry[3].

FIGURE 1 **Liability Roadmap**
Source: *Autonomous Vehicles – Considerations for Personal and Commercial Lines Insurers*, MunichRe, 2016

LEVEL 1 – LEVEL 2 – LEVEL 3			LEVEL 4
As long as autonomous vehicle (AV) systems and operator share control, liability hinges on determining which was in control at the time of an accident.	Increased reputational risk. New cyber liability exposures.	Downstream vendors' and contractors' liability emerges.	AV systems control the vehicle. Liability shifts to manufacturers, including downstream vendors and contractors. Reputational risk levels as autonomous vehicles become established. Cyber liability exposure remains high.

SPOTLIGHT

Integrity of connected systems – test, test, and test again

The fatal crash in May 2016 of a Tesla Model S electric car attracted significant press and regulatory attention. At the time of the accident, the vehicle was operating on autopilot via the use of sensors and computers. Tesla reported that neither the Model S's driver, nor the car's own sensors, detected a large articulated lorry crossing the road ahead, resulting in a collision that killed the driver[4]. For companies developing autonomous vehicles, testing, public acceptance, and ensuring a greater understanding of the uses of the technology will be crucial to their adoption. At the time of the accident, Tesla acknowledged this by describing autopilot as an "assist" feature designed to relieve some of the mechanics of driving, although evidence is increasingly suggesting that some drivers are relying completely on their vehicles' autonomous features[5].

The features that today's vehicles currently provide, such as lane-keeping and automatic braking, are part of a journey towards fully self-driving cars, which are expected to work more safely than those driven by people. However, recognising the unique challenges that the road to full autonomy brings, the University of Warwick is offering an alternative approach to public road testing, a driving simulator specifically designed to "test" driverless vehicles in its "Drive-in, Driver-in-the-loop, multi-axis driving simulator"[6].
One of the key issues to be addressed will be the complex and demanding signal environment and the integrity of intelligent systems and their vulnerability to cyber attack.

CYBER LIABILITY TO TAKE CENTRE STAGE

Autonomous and connected vehicles rely on navigation signals from satellites and, in the future, on signals from connected transport infrastructure. As transportation infrastructure becomes more sophisticated and the autonomous car moves into the mainstream, the integrity and security of the signals involved will be paramount. As vehicles become more connected, the more vulnerable they are likely to become, with hacking a significant concern for manufactures, operators, and owners.

Automotive companies are increasingly moving into a new arena of manufacture in the era of the connected vehicle. Today's supply chains are complex, and often manufacturers don't produce the software contained within their vehicles. Instead, they bolt together different products from a variety of software providers, from airbags to entertainment systems, which then interconnect with one another in the vehicle. With long lifetimes, manufacturers face the probability that the vehicles in circulation will not only have software that is out of date, but that also fails prevailing levels of security and efficacy.

With the connected and autonomous vehicle there will be an even greater attack surface for cyber-criminals, who will have more ways to access the vehicle's network. Manufacturers will therefore need to increasingly utilise remote or "over-the-air" updates to continually update network security and patch systems where vulnerabilities have been spotted.

THE HACKER'S CHALLENGE – SMARTER CARS

In early 2015, Land Rover recalled more than 65,000 cars to fix a software bug that could "unlatch" its vehicles' doors. In that same year, Fiat Chrysler issued a safety recall affecting 1.4 million vehicles in the US, after security researchers showed that they could remotely hijack a Jeep's digital systems over the internet[7]. Recalls of this kind will raise concerns over the possibility of a coordinated attack on a fleet of vehicles, or on an even greater scale for terrorist purposes.

SPOTLIGHT

Data, data, but who owns the data?

The amount and variety of data collected not only brings to the fore privacy issues but also concerns as to how the data is managed:

- What data about a driver's behaviour and vehicle use should be collected?
- How should it be collected?
- How should it be organised and stored?

Liability exposures could arise from the storage of data by the telematics or autonomous system.

LEGISLATION PLAYING CATCH-UP

The UK Government is a keen supporter of autonomous technologies, believing they will one day make our roads safer and less congested. Through the Association of British Insurers (ABI) and Thatcham Research's Automated Driving Insurer Group (ADIG), insurers have already begun detailed discussions about achieving the government's ambition.

A recent government consultation proposed a wave of reforms in order to respond to continuing technological advancements. The consultation, which closed on 9 September 2016, was looking ahead to 2018 and 2021, when driver assistance hands-free, and driver out-of-loop hands-free, motorway driving will be permitted.

The response suggested that drivers should continue to buy a single motor insurance policy to cover both manual and automated driving. In the event of an accident, the victim will have a direct right against the motor insurer, and the insurers will have an improved legal right to recovery, allowing them to get costs back from motor manufacturers, software companies, and/or other responsible parties, to the extent that there is a liability under existing laws, including under product liability laws. Other takeaways from the consultation included:

- 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[8].
- The Government will also amend the Highway Code and Construction and Use Regulations to accommodate driverless technology.

Additional work on public acceptance and understanding of what is safe and legal will be required as the implementation of technology evolves. Until there is significant automation, there is an increased risk of accidents if the technology fails. This is because, once a driver disengages from the car, there's a lag in reaction time to re-engagement, which could result in an otherwise avoidable accident or increase the severity of an accident.

AUTOMATION IN THE UK

It is expected that Level 3[9], or hands-free driving, will be permitted from 2018 for approved motorways in the UK. Regulatory changes will also allow remote parking systems to be used from this time, which can currently only be used on private land, also including the platooning of HGV vehicles. A key focus of the Department for Transport consultation concentrates on the need to accommodate Level 4+ vehicles from 2021 onwards.

The Government, insurers, and manufacturers will need to work to educate the public and fleet managers on the dangers of misuse of Level 3 technologies, and the importance and legal requirements to remain alert and to maintain full concentration and attention to the road at all times.

SPOTLIGHT

New Vehicle Technology and Aviation Bill

Following the 2016 Queen's Speech, which included an announcement of the Modern Transport Bill, the UK Government introduced the Vehicle Technology and Aviation Bill[10] to the House of Commons on 22 February 2017. The Bill – which applies to England, Scotland, and Wales, but not Northern Ireland – lays out several proposals regarding how self-driving cars should be insured and suggests new rules requiring petrol stations and businesses to install more charging points for electric and refuelling stations for hydrogen-powered cars.

The Bill also sets out that the insurance for autonomous vehicles will need to cover when the driver is in manual control and when the car is driving itself. Also, if a vehicle's owner has made unauthorised changes to the car's software or fails to install an update that their policy requires them to, then they become liable. The Bill also proposes that the Department of Transport will determine which cars will be classed as self-driving and become subject to the requirements.

CHANGES TO INSURANCE UNDERWRITING

Historic data has traditionally been used by insurers to model risks, but insurers are now taking a real interest in what businesses do with the data gathered through this new technology. They will only truly recognise the value of a telematics system which can enable policyholders to demonstrate they are using it efficiently to inform their risk management activities and to reduce risk. It is essential, particularly for fleet operators, to apply risk management based on data collected and seek relationships with insurers that understand the use of telematics to obtain premium reductions early in the process, rather than, say, 24-36 months after inception.

CONCLUSION

Connected and autonomous vehicles will offer benefits for drivers, passengers, and society; resulting in fewer accidents, a more efficient use of transport infrastructure, and the potential for increased efficiencies in the operation of fleets. As the road to autonomous vehicles progresses, policymakers will have to pay close attention and introduce legislation to protect the public across the wide-ranging effects of autonomous vehicles, from infrastructure strategy, the licensing of vehicles, cyber security, safety standards, and of course insurance.

The proposal by the UK Government to stagger reform to respond to the technology as it develops suggests that a measured approach is preferred, so as to not stifle the UK's competitive position in this field. Despite this, progress will continue to be made as improvements are implemented. With legal and social systems playing catch-up, litigation will likely be seen in determining liability. Will we witness another Donoghue v Stevenson [1932][11] moment redefining the law on product liability, particularly in relation to software, when it becomes untenable for the law to continue to follow, rather than lead, development?

As laws change, insurance coverages will adapt to meet the needs of customers, which may also result in a fundamental shift in the way risks are measured. Operators should view technological developments as an opportunity to build a more efficient fleet by implementing the new technology as it develops. Also, a greater emphasis on the use of data could allow fleet operators to gain a more detailed view of own their operations in comparison to their peers, thereby enabling efficiencies to be made where possible. In such a dynamic environment, any operator of a fleet will need to work closely with their insurance broker and underwriters to keep them abreast of how they are using technology to ensure they are best positioned to manage the impact successfully.

SPOTLIGHT

Black box technology alive and well in the private car market

Usage-based insurance is already winning market share in the private car market by reducing people's premiums in return for safe driving. Figures released by the British Insurance Brokers Association revealed a 40% increase in the space of a year in the take-up of so-called telematics-based motor insurance policies. Today, almost 455,000 people now use the technology to monitor their driving skills in exchange for cheaper premiums[12].

About Marsh

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About this report

This report has been produced by Marsh's UK Transportation Practice, which is at the forefront of delivering risk advice and solutions to clients across the whole industry, including aerospace and defence companies, automotive manufacturers and suppliers, rail and bus operators, haulage operators, port authorities, and major fleet operators. This report examines how technological change is redefining the nature of risk in the motor industry and how these risks will alter business models in the future. Marsh's Transportation Practice sees understanding and keeping at the forefront of technological change as key to providing best client advice and enhancing the benefits we can deliver to clients' businesses.

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Notes

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