

## Overview

- Autonomous cars (or driverless cars) are firmly in the public domain following high profile research and development projects by the likes of Google, BMW and more recently Ford, among other manufacturers
- Continual media coverage of the subject around the globe has maintained the interest level
- UK Government recently offered £10 million for the first UK City to agree to become a testing ground for autonomous vehicles
- Plans for self-drive cars were announced in the Chancellors National Infrastructure Plan - Government believes the UK can play a pivotal role in the development of the technology, which will also have economic significance

## Timeline

- 2005 'Stanley' project saw Google engineer, Sebastian Thrun (inventor of Street View), and his team win the \$2 million grand challenge prize by Defense Advanced Research Projects Authority (DARPA), a branch of the US Department of Defense
- Origins of the autonomous cars go back to 1925 when the Linrrican Wonder, created by Houdina Radio Control demonstrated a radio-controlled autonomous car on the streets of New York City
- 1930s - General Motors present an electronic car powered by circuits embedded in the roadway and controlled by radio at the 1939 World's Fair event
- 1950s - RCA Labs experimented with miniature cars controlled and directed by wires laid out on its laboratory floor
- 1960s - Road Research Laboratory modified a Citroen DS utilising magnetic cables placed under a road in order to direct the vehicle
- 1980s, Carnegie Mellon University, in a project called Autonomous Land Vehicles (ALV), used laser radar, computer vision and autonomous robot control to achieve the first road-following demonstration of an autonomous car
- 1990s and 2000s witnessed a raft of activity with Daimler-Benz, DARPA, Carnegie Mellon and the ARGO project (University of Parma, Italy) all experimenting with autonomous vehicles
- Early 2000s - The ParkShuttle driverless road system in the Netherlands became operational

- 2006 - the 'Foresight' think tank in UK predicted RFID-tagged autonomous cars to be on UK roads by the mid-2050s, the Royal Academy of Engineers thought driverless trucks would be available as early as 2019

#### Current Status

- In US, four states, Nevada, Florida, California and now Michigan enacted legislation to allow autonomous car testing on public roads
- In December 2013, Nissan became the first company to conduct a public road test of an autonomous vehicle on a Japanese highway
- At Consumer Electronic Show 2014 in early January current car manufacturers such as BMW and Audi showed off the latest car designs and future technology for the autonomous car space
- BMW demonstrated a modified M235i fitted with a new version of the company's ActiveAssist technology which, without any help from the driver, can ensure the vehicle is guided through a demanding driving scenario and brought back into line
- Audi demonstrated a Sport Quattro Laserlight concept car with reduced size sensors and a new Nvidia compact zFAS car computer for use in a number of automated driving actions in the future such as traffic sign recognition, pedestrian spotting and lane departure signals
- Nvidia, along with Google also announced agreements with leading car manufacturers including Honda, Hyundai, GM and Audi to install the Android technology, synonymous with mobile devices, into cars
- Jan 2014, Massachusetts Institute of Technology (MIT) and Stamford University announced an affiliation with Ford Motor Co. to develop an autonomous car
- In the UK, the city of Milton Keynes began experimenting with driverless pods aiming, by 2017, to have 100 pods operating in pedestrianised areas

## **Impact on Insurance Industry**

- *Claims*
  - Potential for a reduction in the number of overall claims along with personal injury claims
  - Potential for a reduction in injury and fatality numbers on UK roads
- *Legislation*
  - Current laws governing UK roads are unlikely to be satisfactory to cover cars that have no driver so wide ranging changes to the current laws may well be required
  - With such a legal grey area, some car manufacturers are already forming working groups to address the topic
- *Safe Driving and Liability*
  - The very nature of an autonomous car is likely to see people actually 'driving' less which has the potential to reduce the skill and ability of drivers who may become unfamiliar with how to manage certain driving
  - There may well need to be changes to driving tests to accommodate the change in driver requirements
  - Regardless of car manufacturers' assurances; the cars may not be accident proof so the first major accident involving an autonomous car will be a significant public relations issue for the entire industry
  - Having both autonomous and non-autonomous cars sharing UK roads will present its own challenges and could add to the grey area of liability
  - Insurers will need to add further category rules to quotes to accommodate both types of vehicle and the varying risk concerns of each
  - At esure, we believe that there may need to be a strict liability measure put in place by the Government in order to provide a blanket understanding of where responsibility lies
- *Technology and Insurability*
  - Insurers will need to assess whether the new technology itself will be costly to repair if it malfunctions or is damaged in any way
  - Technology failsafe measures will need to be considered to avoid accidents if the computer malfunctions while driving or to ward off the risk of potential cyber attacks
  - In-car distractions have the potential to distract drivers during a required manual override such as if the computer malfunctions or if a hazard on the road has not been detected by the system

## Impact on Public

- *Costs*
  - Vehicle costs are likely to be higher until the technology becomes what is termed as mainstream. Economies of scale will be crucial in reducing costs as happened with other car technologies such as cruise control and anti-lock braking systems
  - We expect the ABI rating to be affected when the autonomous technology is fitted
  - Car insurance will still likely be required as vandalism; theft or flooding claims are all examples that are not affected by a driverless system
  - It is also a current requirement under the Road Traffic Act to hold insurance if you wish to use a vehicle on the road
- *Need for car ownership*
  - If autonomous cars can drive, fuel and manage themselves, we may find that we become a society of 'taxi hailers' requesting an autonomous car at will and eradicating the level of expense associated with car ownership
- *Satisfying the desire to drive and reticence to change*
  - There will be a significant segment of the population who enjoy driving and may be reticent to change as a result
  - Manufacturers are already fully aware of this challenge and a BMW spokesperson was recently quoted in a CNN article as saying:

"We have to interpret the driving fun in a new way. That means bringing content and activities to the car so that the driver can make better use of his or her 30 minutes in traffic. They'll still be able to take over during the fun parts, zipping down a curvy country road."

- *Public trust both in terms of data privacy and in losing control in driving situations*
  - There will be subsets of the population who will become 'early adopters' of the technology and others who are cautious and less trusting
  - An autonomous car is asking someone to completely put their trust in a computer to provide secure passage for them in a vehicle that, if it crashes, could have fatal results
  - There remain sections of the population who refuse to use a mobile phone for anything more than calling people while others are banking, creating, viewing and even dating on the same devices
  - It is unknown about the level of data collection a fully autonomous car would be capturing if they become publicly available but privacy will be a concern
  - Furthermore, there would likely need to be legislative changes in order to protect the public against a breach of privacy.

## AEB

- A precursor to the autonomous car can be seen in the wide range of vehicles utilising the autonomous emergency braking (AEB) technology
- There is an emerging range of Autonomous Engine Braking systems that are coming on the market now which could reduce claims and injuries moving forward
- These have already been awarded a lower ABI group (one of the tools used by insurers in the preparation of quotes) compared to previous versions due to the extra safety features
- The quest for all car manufacturers developing new, cutting edge, technology is to achieve the industry safety ratings such as EURO NCAP 5 star to appeal to the customer base
- esure recognises role of AEB in vehicle safety and has agreed to the reclassification of the Volvo and Mazda models, giving them a 2-3% discount. This change will be implemented in mid April
  - Following various papers relating to the developing technologies surrounding Autonomous Emergency Braking (AEB), this paper highlights a few areas where we could reduce premiums in order to encourage lower risk vehicles on our book.
  - There are many variations of AEB systems across all the UK car market but a survey completed by Thatcham, along with individual research has identified 3 manufacturers where we could reward certain vehicle ranges
  - EuroNCAP have highlighted that 80% of Whiplash claims happen at speeds of less than 20km/h. These safety features should help to reduce our claims, especially those for PI
  - Volvo – City Safety
    - Models – S60, S80, V40, V40CC, V60, V60 Hybrid, V70, XC60, XC70, (not XC90)
    - The City Safety system automatically applies the brakes in a harsh manner if it senses an imminent impact with another vehicle and there is no reaction from the driver
    - If the vehicle is travelling less than 16km/h, then the impact can be avoided. Otherwise the damage and injury is potentially mitigated up to 50km/h
    - New Volvo cars recently dropped around 3-4 ABI groups when this technology was released
  - Mazda – Smart City Braking

- Models – Mazda 3 and CX-5
  - The Mazda system senses an imminent impact using LIDAR, then primes the brakes to help cut down response time. If no action is taken by the driver the brakes are automatically applied.
  - This process only works at low speeds of between 4-30 km/h
- esure will continue to work closely with Thatcham and ABI on further recognition for AEB

## Summary

- Thanks for listening today and I hope I've provided some useful information for you
- Some key points to summarise are:
  - Motor technology is already here with much more around the corner, we all need to work together to ensure it keeps safety at its core
  - There are numerous questions around autonomous cars that need answering from both a public and an industry perspective
  - esure recognises the benefits of technology such as AEB that can help to make roads safer
- If you would like any further information on esure as well as our perspective on AEB and autonomous cars, please:
  - Visit [www.esuregroup.com](http://www.esuregroup.com)
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