Royal Society for the Prevention of Accidents (RoSPA) – Written evidence (AUV0025)

- Autonomous vehicle technology is developing rapidly and will profoundly change the way we drive.

- It offers enormous benefits, including significantly reducing road casualties, improving mobility for people unable to drive ‘normal’ cars, and reducing congestion, fuel consumption and emissions.

- However, there are also significant risks, especially during the development and gradual introduction of autonomous vehicles, including failures in the technology, drivers over-relying on the technology or not being able and ready to take over control of the vehicle when required, and data security.

- Estimates suggest driverless cars could be available from the mid-2020s. RoSPA does not believe it will be this soon, but some forms of highly autonomous vehicles may be in use during the 2020s.

- There will be a transitional period of many years during which conventional vehicles, vehicles with Advanced Driver Assistance Systems (ADAS), highly autonomous vehicles and ultimately, fully autonomous vehicles, will be sharing our roads. It will be vital that drivers understand the differences between these vehicles and that those with ADAS and highly autonomous vehicles are designed to help, but not replace, the driver.

- Thorough and ongoing reviews of driving laws and offences will be needed to keep pace with the development of autonomous vehicles.

- Most road traffic laws should continue to apply to highly autonomous vehicles but when fully autonomous vehicles that no longer need a driver to be ready to take control have been introduced, it may be feasible to relax these laws.

- A review of the driver licensing regime for autonomous vehicles will be necessary at some point.

- Public education and awareness raising initiatives will be needed to ensure people develop a proper understanding of autonomous vehicles and their performance abilities and limitations.

- Regulations governing vehicle type approval standards and MOTs will need to be updated.
The Fire and Rescue Service will need regular updates from vehicle manufacturers so they can plan what changes are needed to their equipment and procedures for responding to emergencies.

Manufacturers will need to meet minimum security standards for data protection and cyber security.

Victims of a collision with a vehicle that is operating in an autonomous mode should be no worse off in the level of insurance and compensation they receive than if hit by a conventional vehicle.

Introduction

1 RoSPA’s submission to the House of Lords Select Committee on Science and Technology Inquiry, “Autonomous Vehicles”, has been produced following consultation with our National Road Safety Committee. Our submission focuses on the development of autonomous road vehicles.

2 Autonomous vehicle technology is developing rapidly and will profoundly change the way we drive. We are changing from vehicles with some autonomous functions (advanced driver assistance such as autonomous emergency braking, lane assist and blind spot monitoring) to ones that are highly, but not completely, autonomous (can operate on the road without a driver, but with normal driving controls and a driver who must remain able and ready to assume control). Ultimately these will change to vehicles that are fully autonomous (they drive themselves with the ‘driver’ being just another passenger who does not need to be able and ready to assume control).

3 It is not yet clear when people will be able to buy and use truly ‘driverless’ cars, although estimates have suggested it could be any time from the mid-2020s onwards. Virtually all car manufacturers are developing autonomous vehicles of one form or another, and many have estimated when they expect to have fully autonomous cars available, with their dates varying from around 2020 to 2030.

4 RoSPA does not believe that fully autonomous vehicles will be in use this early, but some forms of highly autonomous vehicles may be in use on certain types of roads (e.g., motorways) during the 2020s. Vehicles with advanced driver assistance systems are already available, a trend which will increase rapidly over the next few years, as the technology becomes more and more sophisticated.

5 There will be a transitional period, probably of many years, during which a mixture of conventional vehicles, vehicles with increasingly sophisticated Advanced Driver Assistance Systems, highly autonomous vehicles and ultimately, fully autonomous vehicles, will be sharing our roads.
Benefits of Autonomous Vehicles

6 We are already seeing road safety benefits from driver assistance technology, such as electronic stability control, autonomous braking, lane departure warning systems, etc. RoSPA believes the further development of autonomous technology will offer enormous benefits by:

- Reducing road crashes and casualties significantly by reducing (or even eliminating) human error by drivers that contributes to a significant proportion of road crashes and casualties.

- Improving mobility for people unable to drive conventional cars, enhancing their mobility, independence and quality of life.

- Improving the use of road space, and reducing congestion, fuel consumption and emissions.

- Reducing insurance premiums, especially for younger drivers, due to the lower crash risk.

7 If autonomous vehicles live up to their promise, the Government should consider providing financial incentives at some point to encourage their take up.

Risks of Autonomous Vehicles

8 However, there are also significant risks, especially during the years of development and gradual introduction, including:

- **Failures in the technology**
  For example, a recent fatal crash in the USA involved a Tesla vehicle with autonomous technology.

- **Drivers over-relying on the technology**
  Drivers may not pay as much attention to their driving if they believe that the technology will prevent them from crashing no matter what. During this period, it must be clear to drivers that vehicles with Advanced Driver Assist Systems and highly autonomous vehicles are designed to help, but not replace, the driver.

- **Drivers struggling to remain able and ready to take over control of the vehicle when required**
  With highly autonomous vehicles, a rarely-involved driver will be required to remain alert enough to take control of the vehicle at critical times and probably at short notice. Maintaining full concentration while the vehicle is driving itself for long periods will be
very difficult; boredom, inattention and distraction will be difficult to overcome. How quickly will a driver need to react? How will they know when and how they need to take control? Will they understand the warnings given by the vehicle?

- **Drivers becoming de-skilled during the transition period**
  As drivers become more used to the vehicles driving themselves, they may become less able to take control of the vehicle when it becomes necessary. Young drivers who start their driving career with highly autonomous vehicles may not be able to accumulate the ability to anticipate situations when they may need to take control, or to drive the vehicle when they have taken control. They may make incorrect decisions or even panic at the moment they need to assume control.

9 It will be important to monitor any such problems during the development of autonomous vehicles so those identified can be designed out as soon as possible and other measures, such as modifications to road design, or driver education and training, can be identified.

For example, an over-reliance on autonomous technology could increase crash risk. It is important that drivers understand that until fully autonomous vehicles are available, the technology is designed to assist the driver, but not to replace him or her.

10 Autonomous vehicles will be reliant on accurate GPS and speed limit data. RoSPA were pleased to hear that the Department for Transport are funding the creation of a detailed digital roadmap by Ordnance Survey.

**Road Vehicle Regulatory Regime**

11 The introduction of autonomous vehicles will obviously require many changes to international, EU and UK laws, regulations and guidance. It is important to consider the implications of the regulatory reform on the use of UK autonomous vehicles overseas, and to liaise with other countries’ on their approach to these issues. In due course, UK drivers will presumably wish to take their vehicles when working or holidaying overseas. Coordination with the devolved Governments in Scotland, Wales and Northern Ireland will also be crucial.

12 RoSPA believes that most existing road traffic laws and rules of the road should continue to apply to highly autonomous vehicles (ones with a driver who must remain able and ready to assume control). For example, the prohibitions on using hand-held mobile phones, drinking and driving should be retained, so that drivers are “able and ready” to assume control of the vehicle if necessary, and so they understand they must do this. There may even be a case for arguing that drivers who are not alert and ready to take control of the vehicle should face stricter penalties to emphasise the importance of the driver remaining alert. It may be feasible to relax these laws when fully autonomous vehicles that no longer need the driver to remain alert and ready to take control, have been introduced.

**Driver Licensing, Training and Testing**
13 As highly and fully autonomous vehicles are developed it will be necessary to decide whether they can be driven on a normal car licence, or whether a new licence category for highly autonomous vehicles will be needed. The driving test is already being adapted to include driving vehicles with new technology through the trial the DVSA is conducting of the use of SatNavs in the test. If it becomes possible for people to take their driving test in a highly-autonomous vehicle, it may be sensible for their licence to be restricted to driving such vehicles (just as someone who passes their test in an automatic car is only licensed to drive an automatic car).

14 A lower licence fee for autonomous vehicles might be a useful way of encouraging their adoption. Once fully-autonomous vehicles are in use, a driving licence may not be necessary, but only when the driver is not required to drive the vehicle in any circumstances.

15 Therefore, a review of the driver licensing regime will be necessary at some point.

16 The Government has been preparing initial changes to the regulatory framework, having:

- established that autonomous vehicles can be tested on any road in the UK
- published a Code of Practice to help testers understand how to comply with the law
- consulted on proposals to change regulations that could prevent the adoption of vehicles with Advanced Driver Assistance Systems and Automated Vehicle Technology as they come to market
- helping to fund research, development, demonstration, and deployment of this technology.

17 Thorough and ongoing reviews of driving laws, offences and civil and criminal sanctions will be needed to keep pace with the development of autonomous vehicles.

Public Education

18 Euro NCAP (www.euroncap.com) conducts independent tests on cars that are more stringent than the legal minimum, so cars given a five star rating by Euro NCAP far exceed the safety requirements set by legislation. It gives higher ratings to cars with active safety systems, such as Autonomous Emergency Braking, Speed Assistance and Lane Support. This encourages manufacturers to incorporate these systems into their vehicles and helps to encourage take-up of these safer vehicles by the public and fleet buyers.

19 As vehicles with increasingly sophisticated technology are introduced, public education and awareness raising initiatives will be needed to help drivers understand the distinction between the different levels of autonomous technology. A crucial message is that until truly fully autonomous vehicles are available, the driver must be fully alert and ready to assume control at all times, and is legally responsible for any accidents that occur.
Promotion and marketing by vehicle manufacturers and media coverage, also needs to help people develop a proper understanding of autonomous vehicles, their performance abilities and limitations, the importance of not over-relying on the technology.

20 For example, it is estimated that trials of HGV Platooning may begin on UK motorways within the next two to four years. Platooning will allow a number of trucks, each equipped to drive as a single body close together at a constant speed, with the lead truck setting the speed and braking of the following trucks. This would reduce fuel consumption, cost and CO2 emissions, as well as improve the efficiency of traffic flows.

21 This technology will allow a much shorter gap between the vehicles in a platoon, because the following vehicles brake simultaneously with the lead vehicle, which reduces their stopping distance by reducing (or even eliminating) the driver’s reaction time. Therefore, potentially the two-second rule for safe following distances (Rule 126 of the Highway Code) could be reduced for these vehicles.

22 However, it will need to be absolutely clear that this only applies to vehicles with this technology and only when they are operating in a ‘platoon’. Great care should be taken to avoid creating a perception that the normal following distances for other vehicles is being changed. People will also need help to understand how they should behave towards platoons, and how they should expect the vehicles in the platoons to behave. Other drivers and motorcyclists will need specific advice on overtaking a platoon of vehicles, along with advice on entering and leaving the motorway if there is platoon of HGVs in lane one.

23 The Highway Code will need to be updated to provide information and advice on Advanced Driver Assistance Systems and should explain the purpose of the new technology as it is introduced and how it should be used by the driver and the risks to avoid.

24 Ongoing education campaigns will be needed to raise awareness of these vehicles, how they differ and how other road users should behave. This should involve central and local government, manufacturers, police, driver training bodies and road safety organisations.

**Vehicle Roadworthiness**

25 It goes without saying that autonomous vehicles will need to be safe and roadworthy, and subject to maintenance regimes to keep them in good working order, which might involve (for example) compulsory software updates. Regulations governing vehicle type approval, standards and construction will need to be updated, as will regulations governing MOTs. For example, MOTs may need to include a check of whether the latest software updates have been downloaded and installed in the vehicle. Training for those who conducted MOTs will need to be updated in parallel.
26 The reliability of these vehicles and their technology will be crucial. If it is much more expensive to repair or replace components, people may be tempted to skimp on maintenance, which could increase the risk of malfunctions.

27 The Fire and Rescue Service will need information from the vehicle manufacturers so they can plan what changes are needed to their equipment and procedures for responding to emergencies (e.g., extricating people from vehicles)

**Cyber Security**

28 The regulatory framework also needs to ensure that manufacturers meet minimum security standards to prevent hacking and to ensure their software downloads do not breach data protection laws. Manufacturers will need to ensure that robust cyber security measures are built into their vehicles and technology.

29 If there are collisions or other types of loss (such as identify theft), where the vehicle owner has not installed security updates, it may be reasonable for insurers to recover their costs from the vehicle owner. If an autonomous vehicle owner fails to follow all reasonable anti-hacking security measures, such as software updates, other victims should be compensated.

30 It should, of course, be a serious criminal offence to hack into an autonomous vehicle, especially where this causes a crash. Where such hacking results in serious or fatal injury, the penalties should be no less stringent than those currently available for causing death or serious injury by dangerous driving. Where the hacker can be traced, the insurer should be allowed to seek to recover the damages from them. They should also be able to recover damages from the vehicle manufacturer if they failed to incorporate sufficient and appropriate anti-hacking security features.

31 Any person injured in a collision caused by someone hacking an autonomous vehicle should be covered by insurance in the same way as someone injured in an accident caused by a stolen vehicle.

**Motor Insurance**

32 Motor insurance rules will need to be developed for vehicles that can drive themselves. Under the current system, motorists must hold compulsory third party insurance to compensate victims of any collision, regardless of who is at fault. When victims are injured by uninsured or untraced drivers, the Motor Insurers’ Bureau (MIB) steps in as the insurer of last resort. This is designed to ensure that victims of road traffic accidents are compensated fairly and quickly.

33 Determining liability where a driver has activated the advanced vehicle technology and disengaged from the driving task could be complex. The fault could rest with the driver
(e.g., if they have failed to retake control when the system exceeded its performance limits) or with the manufacturer (e.g., product failure). RoSPA agrees with the approach recommended by the Association of British Insurers to extend compulsory motor insurance to include autonomous vehicles, rather than place product liability on the vehicle manufacturer. Where an autonomous vehicle crashes, this would provide cover for the ‘not at fault’ driver, passengers and external third parties.

34 The Government has consulted on proposals to:

- Extend compulsory insurance requirements for automated vehicles so the owner must also ensure that there is an insurance policy in place that covers the manufacturer’s product liability.
- Require compulsory product liability insurance for automated vehicles to also cover injuries to the ‘not at fault’ automated vehicle driver as well as passengers and third parties.
- Develop a system to classify an automated vehicle so that manufacturers, insurers and consumers know which vehicles this particular insurance requirement applies to.
- Extend the MIB’s role and the Uninsured Driver’s Agreement and Untraced Drivers Agreement to cover the new mandatory product liability insurance requirements for autonomous vehicles.

35 RoSPA supports these proposed changes. It is important that victims of a collision with a vehicle that is operating in an autonomous mode and in which the driver has (either correctly or mistakenly) disengaged from the driving task, are no worse off in the level of insurance and compensation they receive than they would be if hit by a conventional vehicle.

36 Although our response has concentrated on autonomous road vehicles, and road safety, we recognise that autonomous vehicles have potential in many other safety fields, including

- Remote, autonomous monitoring of assists, such as infrastructure checks for wind turbines or dangerous water spaces, such as weirs, or hazardous or polluted spaces.
- Drones could help in search and rescue by locating victims and deploying rescue equipment before the rescue crew can reach the incident.

37 RoSPA thanks the Select Committee for the opportunity to submit evidence.

25 October 2016