

## House of Lords Select Committee on Science and Technology: Autonomous Vehicles

### Comments provided by Mills & Reeve LLP

25 October 2016

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#### INTRODUCTION

This document is in response to the call for evidence in relation to Autonomous Vehicles issued by House of Lords Select Committee on Science and Technology in September 2016 (the “**Consultation Document**”).

Mills & Reeve is a national UK law firm with 117 partners and a total strength of around 900 staff operating from 6 offices including London, Manchester, Birmingham and Cambridge. Mills & Reeve was named as one of the top five UK law firms in the latest edition of industry "bible", Chambers UK. This year more than 60 per cent of our service areas are ranked in Band 1, the highest percentage of any top law firm.

Mills & Reeve acts for a range of clients who have an interest in the development of driverless cars including automotive manufacturers and suppliers to automotive manufacturers and insurers. We advise a range of clients on issues relating to driverless cars and therefore have a close interest in seeing that a robust legal and regulatory framework is put in place.

For the purpose of this response, we have quoted relevant headings from the Consultation Document and have also repeated the questions asked.

#### IMPACTS AND BENEFITS

##### Question 1: What are the potential applications for autonomous vehicles?

1. As indicated by the Consultation Document there are many potential applications for autonomous vehicles. These include:
  - Privately owned vehicles, used exclusively by their owners or made available through the sharing economy;
  - Public transport;
  - Private and shared taxi services;
  - Shared private use vehicles made available through commercial fleet services;
  - Transport provision for disabled, elderly or under-age users;

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- Freight transport;
- Commercial, industrial and construction site movements;
- Agricultural and horticultural activity.

2. This technology has the potential to transform transportation in almost every context.

## **Question 2: What are the potential user benefits and disadvantages from the deployment of autonomous vehicles?**

3. Potential user benefits include:

- Improved safety profile gained through the removal of driver error together with machine learning and artificial intelligence;
- Potential for cost savings through shared use of private vehicles, use of fleet vehicles or driverless taxis;
- Improved mobility for those currently unable to drive; and
- Better use of time through ability to engage in other activities during journeys and reduced congestion.

4. Potential user disadvantages include:

- Loss of personal privacy due to information sharing and service targeting;
- Interference with the functioning of the vehicle as a result of hacking, computer malfunction etc;
- Loss of the enjoyment of driving; and
- Potential increase in journey length or frequency of journeys (due to spending time in the vehicle doing things other than driving) which could lead to increased congestion.

5. While not affecting users the following benefits and disadvantages to society as a whole can also be identified.

6. Potential societal benefits:

- Reduction in emissions and congestion due to more efficient vehicle use;
- Reduction in the overall fleet size as shared use vehicles become more readily available;

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- Reduction in the need to provide parking, particularly in urban centres, workplaces, etc.
- Removal of the need to allow for rest periods for drivers in relation to public transport, freight, etc.

## 7. Potential societal disadvantages:

- Loss of employment for drivers; and
- Increased burden on the state to provide and maintain adequate connected infrastructure, network capacity, etc.

### **Question 3: How much is known about the potential impact of deploying autonomous vehicles in different sectors?**

8. Much of the attention so far has been given to personal and freight transport. Testing of autonomous and semi-autonomous vehicles for personal transport is now being undertaken in several countries. Freight-related projects are also under way, such as the European Truck Platooning Challenge completed in April 2016.
9. While these projects are fairly widespread detailed data on testing results is not readily available due to the early stage of these projects and/or commercial confidentiality. We expect that data from the current UK testing programmes will be made publicly available as those trials progress.
10. One of the more advanced projects is the testing by Google Inc. of its self-driving car in the United States. A report published in January 2016 by Virginia Tech Transportation Institution, funded by Google Inc. provided information about safety of that project to date. The report sought to compare published crash rates for Google's self-driving cars with recorded crash data in the United States. The authors identified inconsistent recording approaches between US states and an estimated frequency of unreported crashes of between 15.4% to 59.7% as complicating factors. Having adjusted for underreporting and for crash severity, the report found that crash rates for Google's self-driving car operated in autonomous mode were lower than current national crash rates.
11. However, the report acknowledged that the number of miles driven by the self-driving cars were low compared with national miles driven, giving rise to uncertainty in the statistics.
12. It is notable that after 2.3 million miles of which 1.3 million were in autonomous mode, Google's self-driving car had been involved in 16 crashes (11 with the car in autonomous mode).

[http://www.vtti.vt.edu/PDFs/Automated%20Vehicle%20Crash%20Rate%20Comparison%20Using%20Naturalistic%20Data\\_Final%20Report\\_20160107.pdf](http://www.vtti.vt.edu/PDFs/Automated%20Vehicle%20Crash%20Rate%20Comparison%20Using%20Naturalistic%20Data_Final%20Report_20160107.pdf)

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## **Question 4: How much is known about public attitudes to autonomous vehicles?**

13. While a number of surveys and polls have been carried out we are not aware of rigorously collected, statistically significant data that can provide a definitive picture of public attitudes to autonomous vehicles.

14. The results of any survey or poll should, in our view, be treated with significant caution as there is a lack of understanding regarding autonomous vehicles and therefore responses tend to be negative or cautious due to a healthy fear of the unknown.

## **Question 5: What is the scale of the market opportunity for autonomous vehicles?**

15. No response.

## **CREATING AN ENABLING ENVIRONMENT**

### **RESEARCH AND DEVELOPMENT**

## **Question 6: Is the scale of current and planned demonstration facilities for autonomous vehicles sufficiently broad and ambitious?**

16. No response.

## **Question 7: Is the Government doing enough to fund research and development on autonomous vehicles, and to stimulate others to do so? Should it be doing more to coordinate UK actions?**

17. The Government is making an active and high-profile contribution to research and development in this area. Compared with other governments, the UK is notably encouraging and positive towards the development of driverless technology.

## **Question 8: How effective are Innovate UK and the CCAV in this area?**

18. Both Innovate UK and CCAV have made impressive contributions to the debate and testing regime. The approach of enabling private sector activity is probably the most effective way to achieve progress.

## **Question 9: Is the environment for small and medium-sized enterprises (SMEs) working in this sector sufficiently enabling?**

19. No response.

## REAL WORLD OPERATION

### General comments on the Government's approach to driverless technology

20. We agree with the principle of responding to technological changes as they come to market. However, we consider that there are risks involved with the approach outlined in the Government's July 2016 consultation document "Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies".

21. With increasing degrees of automation drivers will increasingly come to rely on the technology within the vehicle to deal with both normal driving tasks and emergency situations. A gradual transition towards greater autonomy may lead drivers to place unwarranted reliance on vehicle systems with the result that they are not in reality "in-the-loop" when required to take action. Manufacturer instructions to drivers to maintain focus and be ready to take back control of the vehicle when required may be effective in some instances, but the following issues arise:

- Reduced reaction time at low workloads and a resulting inability to regain sufficient control within a sufficiently short time period
- Distraction while the vehicle is in autonomous mode
- Loss of driving skills

22. As we explained in our response to the Government consultation carried out in August and September 2014, "Review of the legislative and regulatory framework for testing driverless cars" (available here <http://www.mills-reeve.com/files/uploads/Documents/PDF/Driverless-cars-consultation-Sep-2016.pdf>), we consider that the best way forward is to require the inclusion of autonomous critical event control systems within vehicles having more than a minimal degree of autonomous function.

23. Google is reported to have introduced a driverless vehicle without a steering wheel or pedals after having allowed its own employees to use test vehicles. Despite repeated warnings, after an initial period of monitoring, car users would relax and let the system take over. They would then become distracted and no longer actively monitor the vehicle. Google is then reported to have concluded that it was too risky to create a system relying on drivers to take back control in an emergency. We understand that Google concluded that it was safer not to let the human drivers retake control in an emergency situation.

[https://www.washingtonpost.com/local/trafficandcommuting/self-driving-cars-reach-a-fork-in-the-road-and-automakers-take-different-routes/2016/08/24/5cdeaba8-63d9-11e6-8b27-bb8ba39497a2\\_story.html](https://www.washingtonpost.com/local/trafficandcommuting/self-driving-cars-reach-a-fork-in-the-road-and-automakers-take-different-routes/2016/08/24/5cdeaba8-63d9-11e6-8b27-bb8ba39497a2_story.html)

24. This is supported by a recent Canadian public opinion survey carried out in May 2016 by the Traffic Injury Research Foundation (TIRF) in partnership with the Toyota Canada Foundation (TCF). Over 2,600 Canadian drivers responded to a poll that investigated driver knowledge, attitudes, and practices in relation to semi- and fully-autonomous vehicles. Of these, 16% strongly agreed that it would be unnecessary to pay attention to the road environment when using the self-driving feature of a semi-autonomous vehicle.

[http://www.tirf.ca/media/news\\_show.php?nid\\_id=201&lid=1](http://www.tirf.ca/media/news_show.php?nid_id=201&lid=1)

25. In our view, as increasing levels of automated driver assistance features are introduced, the autonomous emergency systems become increasingly critical such that they should be mandated in vehicles with increasing levels of automated driver assistance. For example, if a highway assist function is available on a vehicle, there should be a complementary autonomous emergency braking system which is capable of operating at all times and speeds that the highway assist function is in operation. Any limitations to the AEB system (for example if it only operates at speeds up to 110kph), should mean that the highway assist function is similarly limited (ie is only capable of functioning at speeds up to 110kph). Such an approach ensures that the increased risks identified above of the advanced driver assist functions are mitigated by the requirement to include complementary autonomous critical event control systems.

**Question 10: Will successful deployment of autonomous vehicles require changes to digital or physical infrastructure?**

26. No response.

**Question 11: How might a move from current levels of highly automated vehicles to their extensive deployment best be managed? What do you see as the key milestones?**

27. We refer to our general comments above. We consider that a gradual transition to fully-autonomous vehicles with incremental degrees of automation to be potentially dangerous. We consider that the question of autonomous critical event control in all vehicles with sophisticated driver assistance systems should be addressed at an early stage, with a requirement that suitable emergency systems be included in all such vehicles. To fall back on driver intervention in the event of an emergency is, in our view, unrealistic.

**Question 12: Does the Government have an effective approach on data and cybersecurity in this sector?**

28. The Government has begun to tackle the issues of data protection and cybersecurity in this sector, but these proposals are not yet at an advanced stage. However, general rules on the protection of personal data are already stringent and provide a suitable basis for development.

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## **Question 13: Are further revisions needed to insurance, regulation and legislation in the UK to create an enabling environment for autonomous vehicles?**

29. We note from the Government's proposals set out the consultation document "Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies" that it plans to address a series of regulatory and insurance matters in the forthcoming Modern Transport Bill. We have provided our comments on those proposals in our response to that consultation (available here <http://www.mills-reeve.com/files/uploads/Documents/PDF/Driverless-cars-consultation-Sep-2016.pdf>). We consider the proposals to be generally sensible subject to our concerns highlighted above around the issue of autonomous critical event control.

## **Question 14: What, if any, ethical issues need to be addressed in the substitution of human judgement in the control of vehicles by algorithms and Artificial Intelligence?**

30. We consider that the ethical discussion around autonomous vehicles has been over-emphasised and is somewhat artificial. We discuss this in more detail in our briefing entitled "Why we should get used to the idea that self-driving cars will sometimes crash" (available here: <http://www.mills-reeve.com/files/Uploads/Documents/Autonomous-Vehicles-Article-Is-it-an-ethical-or-a-legal%20question.pdf>). While it is possible to imagine scenarios in which the self-driving car will make the "wrong" choice judged by human standards, overall the expected improvement in safety will provide a real, practical safety benefit to road users.

## **WIDER GOVERNANCE**

### **Question 15: What does the proposed Modern Transport Bill need to deliver?**

31. We refer to our response to the Government consultation, "Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies". We are generally supportive of the proposals, with some reservations. In particular, we consider that more should be done in order to address the question of autonomous critical event control.

### **Question 16: How effective is the UK's education system in delivering people with the right skills to support the autonomous vehicles sector?**

32. No response.

### **Question 17: Is the Government's strategy and work in this area sufficiently wide-reaching? Does it take into account the opportunities that autonomous vehicles offer in a wide range of areas, not just on the road?**

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33. We consider that addressing individual and freight transport are the most pressing concerns given the advanced state of development and potential impact on public safety. Applications in other areas will be able to follow and benefit from the developments in these areas.

**Question 18: What are the implications of exit from the European Union for research and development and the autonomous vehicle industry in the UK? Are specific actions from the Government needed to support or protect the autonomous vehicles sector in the short term or after the terms of Brexit have been negotiated?**

34. The Government is at the forefront of the deployment and testing of autonomous vehicles. However, important initiatives at European Union level, such as the Platform for the Deployment of Cooperative Intelligent Transport Systems in the European Union (the C-ITS Platform), have the potential to offer a co-ordinated approach to addressing the technical and regulatory issues surrounding autonomous vehicles.

35. The C-ITS Platform has recommended that the European Commission co-operates with non-EU governments in order to promote international consistency. However, Brexit is likely to lead to the UK being able to exert significantly reduced influence over how these projects develop, with a risk that the UK will have to follow rules established by others in order to produce vehicles suitable for the European market.

36. At the same time, the UK may benefit from greater freedom to develop regulation to meet with national objectives, and may be able to move more swiftly towards adoption of autonomous vehicles.

Should you require more information on the responses above please contact Stephen Hamilton or Isabel Teare at Mills & Reeve LLP using the details below.

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