

Driverless car regulation

UK attempts to overtake rivals

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Introduction

In March 2016 the Chancellor announced that driverless cars will be allowed on UK roads by the year 2020, in a sign that the government continues to strongly support the technology.¹

The government's announcement follows the increasing prominence of driverless cars in the media in recent years, with Gartner (a leading technology research and advisory company) describing 2015 as the peak of the driverless car "hype cycle", as the battle between established car manufacturers and technology companies intensified to produce "driverless" or "fully automated" cars.²

Google, perhaps most famously, has led the charge in the development of driverless cars, which are being heralded for their potential to improve road safety and reduce emissions and congestion. At the end of 2014, Google unveiled its prototype³ which it plans for public sale in 2020.⁴ In November 2015, Tesla announced the release of its Autopilot software (an advanced cruise control system) and aims to achieve full automation within three years.⁵ In the same month Ford began testing its prototype on private roads⁶ with the company predicting driverless cars on public roads within five years.⁷ In 2016 a number of other major car manufacturers (such as Toyota, Nissan-Renault, Audi and Volvo) each announced their plans to introduce driverless cars.⁸

With leading technology companies pioneering driverless systems, and the concept of driverless cars backed by established players in the automotive industry, it seems likely that driverless cars (or at least other advanced, new, driverless technologies) will be publicly available within the next few years. Although the government has announced its aim to see driverless cars on the roads by 2020, have lawmakers and regulators moved quickly enough to match the pace of innovation?

Response by regulators

In February 2015 the UK's Department for Transport (DfT) published *The Pathway to Driverless Cars (Summary report and action plan)*⁹ setting out the government's plan to update UK laws and regulations to permit the sale of driverless cars to the public. The government's publication is a signal to the technology and automotive industries that the UK welcomes the development of driverless technology and encourages car manufacturers to establish their testing and manufacturing operations in the UK.

The action plan makes it clear to the relevant industries that the testing of driverless cars on public roads is lawful in the UK¹⁰ - this sets it apart from many other countries in which driverless technology remains either prohibited (for example in countries which are signed up to the Vienna Convention on Road Traffic) or not expressly approved, as regulators struggle to determine whether they can be regulated under existing laws. The UK's efforts to move

¹ <http://www.independent.co.uk/life-style/gadgets-and-tech/news/google-driverless-cars-george-osborne-budget-uk-roads-2020-a6926736.html>

² <http://www.gartner.com/newsroom/id/3114217>

³ http://www.mercurynews.com/business/ci_27190285/googles-goofy-new-self-driving-car-sign-things

⁴ <http://www.ibtimes.com/google-inc-says-self-driving-car-will-be-ready-2020-1784150>

⁵ <http://www.theguardian.com/technology/2015/nov/20/tesla-self-driving-car-tech>

⁶ <http://jalopnik.com/ford-is-now-testing-driverless-cars-on-the-streets-of-a-1742535477>

⁷ <http://www.bloomberg.com/news/articles/2015-01-06/ford-ceo-fields-predicts-driverless-cars-on-roads-in-five-years>

⁸ <http://www.marketwatch.com/story/renault-nissan-gives-details-on-driverless-vehicle-plan-2016-01-07>

⁹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/401562/pathway-driverless-cars-summary.pdf

¹⁰ "Real-world testing of automated technologies is possible in the UK today, providing a test driver is present and takes responsibility for the safe operation of the vehicle; and that the vehicle can be used compatibly with road traffic law."

quickly to establish itself as a centre for driverless technology is, in part, a response to similar efforts by other countries, such as the U.S., Japan (which has issued driverless cars with licence plates to allow testing on public roads since 2013) and, closer to home, Germany¹¹, France¹² and Sweden¹³, which have all publicly backed the technology. In February 2016, the US National Highway Traffic Safety Administration softened its position on driverless cars by signalling that it is prepared to consider non-human drivers as “drivers” under the Federal Motor Vehicle Safety Standards. Prior to this, a car without a human driver had not been considered roadworthy.¹⁴

The UK government has been so keen to court the driverless car industry that it confirmed the lawfulness of the testing of automated cars on public roads in the *Summary report and action plan*, months in advance of the release of *The Pathway to Driverless Cars: A Code of Practice for testing*. The Code of Practice prescribes a road safety framework under which such technology should be tested (the “Code”).¹⁵ The UK government, like many others, is grappling with the challenge of drafting clear, binding regulations for automated cars without much visibility of the finished product which will eventually be offered to the public. However, it seems likely that the regulations will closely resemble some of the aspects of Code, as it addresses key issues such as road worthiness, insurance, and liability in the event of an accident.¹⁶

Code of Practice for public testing

The Code emphasises the importance of safety on public roads and, prior to this, the testing of the technology on the test track. Although most of the Code is not mandatory, instead setting out new guidelines specific to driverless cars, it does require that driverless cars comply existing road traffic laws (such as those covering the licensing of drivers and the road worthiness of vehicles). Nonetheless, the Code on its own face suggests that compliance with all aspects of the Code will be relevant to legal proceedings¹⁷ - for example, if a testing organisation can prove it has complied with the Code it may be able to defend itself from a negligence claim in the event that the driverless car is involved in an accident.

Further below is a summary of the key principles in the Code.

¹¹ <http://www.theguardian.com/technology/2015/feb/01/germany-laws-driverless-cars-autobahns-google-industry>

¹² <http://www.connexionfrance.com/france-economy-roads-public-driverless-self-driving-cars-2015-test-15981-view-article.html>

¹³ <https://www.media.volvocars.com/global/en-gb/print/136182?print=1>

¹⁴ <http://www.bbc.co.uk/news/technology-35539028>

¹⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446316/pathway-driverless-cars.pdf

¹⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446316/pathway-driverless-cars.pdf

¹⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/446316/pathway-driverless-cars.pdf, paragraph 1.5

General requirements

- **Comply with road traffic laws:** vehicles under test on public roads must obey all relevant road traffic laws. For example the *Construction and Use Regulations*, which broadly require cars to be in a condition which shall not present a danger to the public, specify certain mandatory design features (such as a windscreen¹⁸) and require the person driving the car to be able to “have proper control of the vehicle”.¹⁹ Furthermore, the responsibility for safe testing rests with the testing organisation and each such organisations must:
 - ensure that the test driver holds a driver’s licence and has been adequately trained to operate the test vehicle
 - conduct risk analysis of the proposed testing and plan risk management strategies in the event testing goes wrong or presents a danger
 - consider the effects of testing on other road users, consider any adverse consequences which may arise as a consequence of the testing and address them.
- **Insurance:** the statutory requirements for insurance apply to the testing of driverless cars and the operating organisation must ensure that its activities are covered by its policy.
- **Infrastructure and transport authorities:** testing organisations should engage with transport and highway authorities, particularly in the areas in which testing is to be carried out. Such authorities may impose their own restrictions or guidelines (for example, by requiring other road users to be notified of the testing by displaying road signs in the area).
- **Engagement:** testing organisations should consider the benefits of developing a public relations strategy to inform the public of the nature of the testing, the benefits of driverless cars, the implications for other road users and address any concerns about the risks presented by driverless cars.

Test driver, operator and assistant requirements

- **Licence:** during testing a licensed and trained person should supervise testing at all times and be capable of overriding the automated operation of the car if necessary. The driver must hold the appropriate category of driving licence for the vehicle being tested on a public road.
- **Training:** test drivers require skills beyond those of drivers of conventional vehicles as well as a thorough understanding of the capabilities and limitations of the technology. Test drivers should have trained specifically for the moment that the car transitions between driverless control and manual control, particularly as the need to assume manual control may arise in an emergency situation.

¹⁸ The Road Vehicles (Construction and Use) Regulations 1986, Regulation 30(1), <http://www.legislation.gov.uk/uksi/1986/1078/regulation/30/made>

¹⁹ The Road Vehicles (Construction and Use) Regulations 1986, Regulation 104, <http://www.legislation.gov.uk/uksi/1986/1078/regulation/104/made>

Vehicle requirements

- **Technology:** the vehicles must be roadworthy and the testing organisation must ensure that vehicles under test on public roads are capable of being tested in such a way that complies with UK road traffic law. The driverless cars must have successfully completed in-house tests prior to being tested on public roads.
- **Data recording:** vehicle sensors should be sufficiently developed to be capable of responding to all types of road user. The car should be fitted with data recording devices which capture some key pieces of performance information (including its speed, the proximity of other road users and whether the car is operating in manual or automated mode). The data must be stored securely and accessible to the relevant authorities on request. It is not a requirement that cars must be fitted with audio and video recording equipment although this may be desired by the testing organisation.
- **Data protection:** testing is likely to involve the collection of personal data (as defined under the Data Protection Act 1998), such as the behaviour and location of test drivers and other road users. The processing of such data must be compliant with the relevant law - for example, it must be used fairly and lawfully, kept securely and retained only for as long as is necessary.²⁰ The DfT recommends that the testing organisation carries out a privacy impact assessment.²¹
- **Cybersecurity:** driverless vehicle manufacturers should ensure that the automated systems have appropriate levels of security built into them (for example addressing the security principles in BSI PAS754 concerning software trustworthiness²²) and they should manage any risks which may arise as a result of unauthorised access.
- **Transition between automated and manual modes:** the system used to transition between automated and manual control should:
 - be easily and clearly understood by the test driver
 - ensure that the driver is given clear indication of which mode the car is operating in
 - ensure the driver is given sufficient warning of when manual control becomes necessary
 - allow the driver to quickly and easily retake control of the vehicle
 - be proven during track testing prior to testing on public roads.
- **Failure warning:** if there is a failure in the automated driving systems the test driver should be made aware of the failure by an audible warning. The driverless car should be designed so that in the event of a failure in automated braking or steering, manual braking and steering remain possible.

²⁰ The data protection principles, Part 1, Schedule 1, Data Protection Act 1998, <http://www.legislation.gov.uk/ukpga/1998/29/schedule/1>

²¹ Information Commissioner's Office, <https://ico.org.uk/media/for-organisations/documents/1595/pia-code-of-practice.pdf>

²²

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/386093/The_UK_Cyber_Security_Strategy_Report_on_Progress_and_Forward_Plans_-_De____.pdf

- **Software level:** automated driving systems will rely on operation and interaction of software which may, from time to time, be updated. Software should be tested during simulation and on closed test tracks prior to being tested on public roads.

Any organisation intending to test driverless cars on public roads should understand the requirements and guidance set out in the Code. The DfT indicates in *The Pathway to Driverless Cars: summary report and action plan* that it would update UK regulations to accommodate driverless cars by the summer of 2017²³ and it seems likely that the key principles of the Code will inform the new regulations. The DfT has set itself targets to consider, including (i) whether existing legislation adequately covers how liability between manufacturer and driver may be apportioned; (ii) licence requirements for fully driverless car operators; (iii) whether the software which operates the driverless system should be subject to a specification; (iv) the standardisation of the system for the driver to take control in an automated vehicle; and (v) a more general review of the adequacy of existing laws and regulations and whether The Highway Code should be updated to accommodate driverless cars.

The Future

Gartner has made optimistic predictions about the future of driverless technology, but has also warned that mainstream media coverage of the industry has led to unrealistic and premature expectations, pointing to the sizable technological gap between automated technology (where technology assists a driver) and fully autonomous vehicles.²⁴ For example, the requirements in the Code that driverless cars must in any event be capable of being controlled by the occupant may mean that the design of driverless cars will very closely resemble those in use today, both in form and specification. Gartner further predicts that cybersecurity may become the number one concern connected to driverless technology and is one example of an issue which has only just begun to be considered by regulators.²⁵

The rapid and simultaneous development of the technology and the regulations presents challenges for legislators and car manufacturers alike, particularly given the government's stated deadline for the finalisation of new regulations by 2017. Such is the pace of innovation, there will be further twists and turns to navigate.

²³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/401562/pathway-driverless-cars-summary.pdf

²⁴ <http://fortune.com/2015/08/20/self-driving-car-hype/>

²⁵ <http://www.v3.co.uk/v3-uk/news/2382972/driverless-cars-at-risk-from-hackers-and-software-glitches>

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