EU Member States

This section reviews the activities related to regulation of automated vehicles as reported by the different Member States: Germany, The Netherlands, UK, France, Sweden, Finland, Spain and Greece.

1.1.1 Germany

Germany has been studying the legal aspects of vehicle automation systems to determine what legal changes may be needed and how these relate to different levels of vehicle automation (which they defined very carefully and precisely). A joint work [4] of the Working Group of the German Federal Highway Research Institute (BASt) led by Tom Gasser had considerable impact on the expert community. For the first time, a study made an extensive legal assessment with respect to regulatory law and liability law, and, offered a classification of the degrees of automation from a
policy perspective. This definition was at the source of the NHTSA levels and eventually the SAE standard\(^1\).

The study suggested that the current legislation would allow partial automation levels on public roads i.e. “The system takes over longitudinal and lateral control, the driver shall permanently monitor the system and shall be prepared to take over control at any time.”

Further, BASt has proposed to work on other dimensions namely the speed range and utilisation time. They have proposed three speed ranges from manoeuvring level, traffic jam assist / city speed and highways, and, three utilisation time, short, medium and long. These concepts are further explored in the RESPONSE4 activity of AdaptIve, which should publish their first results in September 2015 along with the AdaptIve workshop in Paris.

The German Federal Ministry of Transport and Digital Infrastructure established a Round Table “Automated Driving” in November 2013. This Round Table can be considered as a national platform where all relevant stakeholder groups (Federal Ministries involved, public authorities, industry, insurance companies, user associations, technical inspection, research institutes) are represented. The operational work is done by the Working Groups “Legal Issues”, “Driver/Vehicle” and “Research”. The objectives are building a consensus with respect to core issues of automated driving thereby creating basic precondition for the implementation of highly automated driving. This national platform also acts as an advisory board of the Federal Ministry of Transport and Digital Infrastructure. Contact person: Dr. Christhard Gelau (christhard.gelau@bmvi.bund.de). More information is maintained on the NMVI website: http://www.bmvi.de/EN/TransportAndMobility/Mobility/AutomatedDriving/

At its third meeting on 10 June 2015, the plenary session of the Round Table approved the reports submitted by the chairs of the Round Table working groups. The working groups discussed issues and challenges relating to automated driving, including the approval procedures for automated systems, questions of liability and research requirements. The report by the Research Working Group on the need for research into vehicle automation is publicly available which marks the successful conclusion of the group.

In addition, the plenary session of the Round Table had set itself the objective of developing strategic benchmarks for the evolution of automated driving over the period to 2020. At its meeting on 10 June 2015, the plenary session adopted these strategic benchmarks. The benchmarks focus on the introduction of highly automated driving by 2020 and address several thematic areas. This is based on the likely scenarios for the deployment of highly automated vehicles. As deployment scenarios for 2020, the focus will be on the motorway and multi-storey car park environments.

In June 2015 the research program “New Vehicle and System Technologies” was published by the German Federal Ministry of Economic affairs and Energy.

In Sept 2015, Germany’s Minister of Transport has announced a project that will see a section of the A9 autobahn that connects Berlin and Munich set up for autonomous vehicle testing. The A9 project will include infrastructure provisions for vehicle-to-vehicle communication, as well as

\(^1\) SAE defines an additional level of automation, essentially the fully automated eTaxi concept
liberating the 700 MHz radio spectrum. The project is expected to get underway as of the end of 2015.

In September ahead of the Frankfurt motor show, the BMVI published its "Strategy for automated and networked driving" in which Germany wants to “establish a legal framework in which an automated and networked vehicle can autonomously take over driving tasks, without the driver having to constantly monitor the system.” The strategic paper focusses on the “Legal Certainty” needed for deployment of automated vehicles which includes work on:

- International Legal Framework: extension of the definition of driver, R79, ...
- National Legal Framework: allow use of automated and networked vehicles, consider situations where the system performs the driving, ...
- Driver Training: handover and takeover of the driving task, ...
- Technical Approval and Inspection: adoption of Code of Practice, PTI, ...

1.1.2 The Netherlands

On June 16th 2014, the Dutch Minister of Infrastructure and Environment announced in a letter to the Dutch Parliament its intention related to the promotion of automated driving in the Netherlands.

The high-quality infrastructure of the Netherlands combined with the positive cooperation between the automotive industry, researchers and the government make the Netherlands an extremely suitable country for the intended innovation, development and use of self-driving cars. Compared with neighbouring countries, they have a high-quality main road network, with sufficient slip roads and a high-quality separation of traffic. Moreover, RDW is already a significant global party for the certification of new vehicles, as recently occurred with the Tesla. Many German manufacturers have their new models certificated by RDW for the European market. The Netherlands is also among the frontrunners when it comes to the combination of autonomous driving and vehicle-to-vehicle communication, aimed at creating high (societal) added value, with the long history of cooperation between government and industry and knowledge institutes as a key factor.

A progressive and collaborative government can reinforce this good baseline position. This is another field where the Dutch have a lead, because they are accustomed to cooperating with knowledge institutions, market parties and authorities, witness the national public-private Connecting Mobility action programme, the cooperative ITS corridor of Rotterdam-Frankfurt-Vienna, and the Dutch Automated Vehicle Initiative (DAVI). The sector is already involved in small-scale trials on the main road network, such as the Dutch Integrated Test Site on Cooperative Mobility (DITCM) in Helmond.

As of July 2015, the Ministry of Infrastructure and the Environment (I&M) has opened the public roads to large-scale tests with self-driving passenger cars and lorries. The Dutch rules and regulations have been amended to allow large-scale road tests. In collaboration with Rijkswaterstaat and the RDW (Dutch Vehicle Authority), the Ministry of I&M have been exploring safe ways to
conduct tests on the public roads. The RDW is responsible for the admission of vehicles to the public roads, including self-driving passenger cars and self-driving lorries.

Under the amended legislation, the RDW (Dutch Vehicle Authority) has the option of issuing an exemption for self-driving vehicles (in Dutch). Companies that wish to test self-driving vehicles must first demonstrate that the tests will be conducted in a safe manner. To that end, they need to submit an application for admission.

The Dutch EU Presidency in Q1 of 2016 will provide possibilities for showing the way in cooperation at European level.

1.1.2.1 Learning by doing
The sector and researchers expect it to take many years yet before self-driving cars will be usable safely and on a large scale. The automatic functions will be increased step-by-step and will need to be tried out in practice. This is important on account of the technical availability and on account of consumer acceptance of these applications and their confidence in using them. To be ready for issues that lie ahead, we will adopt a flexible stance and will cooperate intensively with stakeholders. The Netherlands will examine questions concerning data (ownership, management, interchange and security), liability, driving skill requirements and the potential impact on the (digital) infrastructure. These are questions that will receive extra attention during the transition, because for many years there will still be mixed usage of legacy cars and models with (completely) autonomous functions. There are also initiatives taken to research the impact on the insurance branch.

It is essential to perform tests to monitor the use of new technology and to set down the necessary regulations. Testing will allow other road users to become accustomed to these vehicles on the roads.

The approach to enable large-scale testing in the Netherlands

1. Implement innovation-promoting legislation
   a. To enable self-driving cars (and tests with them) on the public highway from a legal point of view, the existing Order in Council (the decree allowing exemption for exceptional transport movements) under which RDW grants exemptions has been amended in July 2015.
   b. The Netherlands will additionally strive for national/international legislation that enables the market introduction of self-driving vehicle technology. For this purpose we will take the initiative in international consultative bodies (EU and UN) and we will support relevant proposals. In preparation for the Dutch Presidency of the EU in 2016, the Netherlands will take stock of which regulations/frameworks would need to be amended at European level for self-driving cars, or where a joint framework is desirable. The Netherlands will naturally cooperate with other countries in this respect.

2. Facilitate large-scale practical tests and develop knowledge
   a. RDW provides information on the conditions and the locations for performing the aforementioned test in Dutch and English on its website (www.rdw.nl)
b. We will use the first tests to develop a basic procedure and a set of conditions for structurally testing automatic vehicle technology in practice. The objective is to conduct safe tests and structurally to assure knowledge for subsequent initiatives and projects. To this end the Dutch Rijkswaterstaat is cooperating with knowledge institutions, the business community, RDW and road managers.

c. Rijkswaterstaat will participate actively in international initiatives. For example, we participate in the World Economic Forum, where together with the automotive industry and other relevant parties the barriers and possible solutions for self-driving cars will be identified. This might include issues concerning data (ownership, management, interchange and security) and liability. At national level we will commission studies into these subjects, also factoring in privacy and driving skill requirements.

3. Make the Netherlands an international leader and interact with the general public

a. Together with the automotive industry and knowledge institutions, the Netherlands will look for further ways of making the Netherlands an attractive test country and promoting this role. The Netherlands will encourage new test applications by means of direct contacts with car and lorry manufacturers and by building up an international network in this field.

b. The Netherlands is starting with an initiative to create a community of early adopters for insights into practical experience and a 'challenge' with self-driving cars on the public highway (similar to the World Solar Challenge for solar-powered vehicles) as a platform for parties working on this development.

1.1.3 United Kingdom

As part of the 2013 National Infrastructure Plan, the UK's then government announced its plan to review the legislative and regulatory framework for developing and testing driverless cars on UK roads; In parallel the 2013 Autumn Statement, stated that government “will work to encourage the development and introduction of autonomous vehicles”.[1] The importance of this issue – not only in terms of potential transport benefits – was reaffirmed by the UK Automotive Council, chaired by the Business Secretary. The Council recognises that autonomous vehicles are a key technology for the UK - especially so, given the strength of UK based automotive research and development, and industrial output.[2]

On 30 July 2014, the then government launched a collaborative R&D competition, looking at driverless cars, inviting UK cities to join together with businesses and research organisations and host vehicle trials locally. Following substantial interest from potential applications, the winners of the £33m three cities driverless car competition were announced in December 2014, with a joint bid between Milton Keynes and Coventry and further bids from Bristol, and Greenwich being successful. These trials will help to understand how connected autonomous vehicles will operate and interact with other vehicles and road users. Further details on each of the projects can be found at paragraphs 4.11 – 4.13.

Over the summer of 2014, the UK Department for Transport (DfT) launched a Call for Evidence to support the regulatory review on driverless cars to help identify
any issues, including regulatory, safety and social issues, which need to be addressed whilst maintaining existing high levels of road user safety

- the best ways to trial cars with qualified drivers and, looking further ahead, fully autonomous vehicles

The review culminated in the publication of the Pathway to Driverless Cars [5] in February 2015 which highlights that there are, in fact, few obstacles to the testing of highly and fully automated vehicles on UK roads. In addition there is also no requirement for special permits or bonds to be put in place unlike in many other countries. The Pathway set out a number of actions for government, and others, to facilitate the development, testing, sale and ultimately use of connected and autonomous vehicles.

The first set of actions were delivered with the publication of the Code of Practice for testing of automated vehicle technology [6] in July 2015, which was developed in collaboration with industry, academia, and all levels of government, including local authorities and devolved administrations. The Code of Practice is a light touch approach to regulation, helping making the UK a world leading place to test driverless cars, while maintaining safety without placing additional regulatory burden on industry. The key requirements are:

- Vehicles under test on public roads must be road worthy;
- Vehicles should be insured and obey all relevant road traffic laws;
- when tested on public roads or in other public places there should be a test driver (or test operator) who supervises the vehicle at all times and is ready and able to override automated operation if necessary.; and
- automated vehicles under test should be fitted with a data recording device. The data should be able to be used to determine who or what was controlling the vehicle in the event of any incident
- The driver (or operator) is responsible for ensuring the safe operation of the vehicle at all times whether it is in a manual or automated mode. Therefore the Code sets out that the test driver or test operator should hold the appropriate driving licence, and be trained to perform this role by the organisation responsible for conducting the testing. In addition, testing organisations should have robust risk management procedures in place.

Recognising the need to continue to catalyse collaborative research and development activities, a new Intelligent Mobility Fund, was announced by the Chancellor of the Exchequer in the March 2015 budget, with Government funds matched by industry. The first £20m competition was launched in July 2015. The competition was focused around the themes of connectivity, autonomy and customer interaction – along with catalysing new business models with the expectation that successful proposals would include the following elements:

- interaction with other road users
- research and investigation of public acceptance
- safety and cyber security (integrity, confidentiality and availability) to ensure that projects are ‘safe and secure by design’

The competition invited consortia of all sizes from both overseas and the within the UK to engage in collaborative R&D projects. In addition to collaborative R&D projects the competition also set aside
£2.5 million of the funding for feasibility studies. The winners of the first £20m competition are to be announced in early 2016.

The DfT also contracted a preliminary study on the technical feasibility of road trains, or HGV Platoons, on the UK roads. Elements of the study have been published by TRL and Ricardo at the RTIC2014 [6]. DfT is working with Highways England on platooning trials to test the operational viability of this technology on UK roads. These are intended to start in 2016, initially on private land, and eventually onto the Strategic Road Network – the motorways and major trunk roads in England.

In addition to these pieces of work, the DfT and the Department for Business Innovation and Skills have established a joint policy unit – the Centre for Connected and Autonomous Vehicles (CCAV) – to ensure that the UK maintains its leadership position in the CAV space and captures maximum economic value from the rapidly developing landscape of CAVs. CCAV will provide a clear policy framework to facilitate collaboration and mitigate the risk that R&D learning is not captured and shared across sectors or coordinated towards a common vision. CCAV will be co-ordinating government activity to ensure that the regulatory framework, at a national and international level, continues to support research, development, demonstration, and deployment, as well as sale and use of CAVs.

The UK has also been active in the field of Co-operative Intelligent Transport Systems, including:

- **London-to-Dover Connected Corridor**, which will establish a ‘connected corridor’ on the A2/M2 - a key strategic route linking London with Kent, Ports of Dover and Calais, and continental Europe. This will be the flagship Co-operative ITS test bed, acting as a living lab, for deploying wireless communications technology, and developing V2V and V2I information services and approaches to data management. The project, worth £20 million, is being delivered by DfT working with Highways England, Transport for London and Kent County Council. There is also scope to secure EU funding for this scheme. Feasibility studies, along with experimental design and impact assessments are now underway, and due to complete in 2016. Deployment would begin in 2016/17. The lessons from the corridor will help shape the next generation of roads technology and inform major decisions about future operations and investment on the major roads in England.

- **Compass4D**, which concentrates on giving traffic signal priority to an express bus corridor to improve energy efficiency and reduce road congestion. As part of the wider European Compass4D project, DfT is providing funding worth £650,000 for deployment; it is expected that the project will be operational in June 2016.

### 1.1.4 France

Already during the PREDIT 2 period (1996-2000), the French research centres were studying the issues of the introduction of automation in road transport. The focus was very much on the introduction of more and more ADAS which at this time did not require changes of legislation. Also, French activities on Cybercars attracted media attention but were not mature enough to start regulatory actions.

In Sept 2013, the French government announced a strategic review to define France’s industrial policy priorities or “Nouvelle France Industrielle” framed into 34 industrial renewal (or "reconquête industrielle") initiatives. Their aim is to focus economic and industrial stakeholders around common
goals, to align government means more effectively to these goals, and to harness local ecosystems to build a new, competitive French industrial offering that is able to win market share in France and internationally, thereby creating jobs.

Among the 34 priorities, “driverless vehicles” or “Véhicule à pilotage automatique” has attracted a lot of media attention. The aim of this initiative is to make the French automotive sector a pioneer in vehicle automation, notably by removing regulatory barriers to growth.

The action plan for this action was made public in July 2014 [51]. One of the five actions for the driverless vehicles is to “change the regulatory and normative framework for experimentation and the placing on the market of autonomous vehicle”, especially the “Changes in the regulatory and normative framework for experimentation and the placing on the market” and “Establishment of an insurance scheme”.

In Spring 2015, the Public Authorities released an provisional administrative procedure that any company that would like to conduct real-world experiments on open roads for automated driving should comply with. The procedure consists of filling out a form and drafting two reports (one describing the objectives and the design of the experiment and the second one describing the technology used in the experimental vehicles). All documents have to be sent to 3 ministries for they can collectively decide whether or not they officially authorize the experiments, essentially based on the safety aspects of the experiment.

The current ‘administrative procedure’ is to turn into a regulatory procedure in 2016. The first text has been published in August 2016 and two other texts should follow before end of year. Early 2017, the full regulatory procedure will be in place.

Since the administrative procedure has been released, a few companies or research institutes have applied and experiments are currently going on on French roads. Large-scale experiments for first use cases of automated driving are expected by 2018.

For 2018, the same action plans the establishment of an insurance scheme in the form of an “Autonomous vehicle special insurance fund.”

Finally, in 2019, a series of standards on the process and test rules for automated vehicles.

1.1.5 Sweden

1.1.5.1 Transportstyrlesen

Beginning of September 2014, The Swedish Transport Authority (Transportstyrlesen) unveiled its feasibility study on the need to modify the Swedish traffic and vehicle regulations in view of the increased automation in the transportation system. This pre-study was presented in conjunction with the Road Safety Conference in Tylösand [7].

The study concludes that there is currently no need for major changes as the partially automated driving systems require that a driver is behind the wheel ready to take over operating control. This means that the responsibility remains with the driver. Driving tests do not need to change because of the new technology.
The pre-study notes that the Transport Agency needs to be more proactive and be active in the development of automated vehicles, and that the law should not stand in the way of technological developments that contribute to better safety, environment and accessibility.

The pre-study lists a number of areas that the Authority intends to work with the future including:

- Participate in or follow the relevant test activities (eg, Drive-Me project and KTH’s automated public transport (bus) project)
- Continue to investigate opportunities to experiment with fully self-driving vehicles on public roads in limited areas.
- Continue to monitor and participate in the work on the EU-level legislation in the field of automated vehicles, cooperative road systems and intelligent transport systems.
- Monitor developments at the international level including USA.
- Increasing knowledge of the safety of complex and safety-critical systems may be requested.
- Investigate the impact of such systems on the community planning.
- Deepen cooperation with the Ministry of Industry, other government agencies, industry and academia to contribute to a national consensus.

Transport Agency’s Director General, Staffan Widlert has also pointed out the importance of automated vehicles provide new opportunities for people who get their license revoked because of illness.

The full pre-study in Swedish is available online on the agency’s website.

1.1.5.2 Lindholmen Science Park

Lindholmen Science Park is leading a national process out from “the Automated Transport System”. The current main activity is to establish a so called Strategic Innovation Program through the Swedish Innovation Agency Vinnova. Along this activity Lindholmen is involved in other initiatives, like the Drive Me project, initiated by Volvo Cars. Drive Me partners are currently the Swedish Transport Administration, the Swedish Transport Agency, the City of Gothenburg and Lindholmen Science Park.

From a test & demonstration perspective it is also valid to mention the infrastructures now in place in Sweden; SIM-4 (a full scale driving simulator run by the Swedish institute VTI) and ASTA (a recently inaugurated proving ground for active safety and autonomous drive, run by ASTAZero, a company owned by Chalmers and SP).

Legal and regulatory issues are clearly a very important dimension concerning automation of the transport system. Lindholmen Science Park, as a partner in the Drive Me project, and as the host of the national strategic Innovation Program, will engage the Swedish Transport Agency and other relevant organisations, in order to secure the necessary development needed.

1.1.6 Finland

The Ministry of Transport and Communications, together with the Finnish Transport Safety Agency, has closely examined all legislation and regulations related to automated driving in Finland. The Ministry has come to a conclusion that current Finnish legislation (including adherence to international conventions) allows for the use and testing of self-driving vehicles on public roads given
that each vehicle has a specified driver and that the driver is, at all times, able to take control of his vehicle. The Ministry has found that there is no legislative or regulative requirement for the driver to be inside the vehicle, which allows, in principle, for solutions that use remote control (similar to remotely piloted aircraft).

This means that current legislation and regulations in Finland allow for the testing of very high-level automated driving and that no additional regulations or amendments are currently needed. The Ministry of Transport and Communications will work together with other authorities, cities and commercial actors to enable and support testing of automated vehicles in different test environments around Finland (e.g. Muonio, Tampere, Ivalo). Finland also participated in the EC-funded CityMobil2 project and hosted an automated bus pilot in the city of Vantaa. Finnish authorities have also actively participated in the planning of the European Truck Platooning Challenge 2016.

Finland has established a single contact point for automated vehicle trials that is operated by the Finnish Transport Safety Agency. The contact point provides support and information to anyone planning automated vehicle trials in Finland. Organisations can use it to apply for a test plate certificate that allows for the use of automated vehicles on Finnish public roads. In the case of type-approved vehicles that have already been registered in another EU country, no test plate certificate is required.

As part of enabling automated driving, the Ministry and other road and transport authorities have been developing a roadmap for automated driving that will be finalized in December 2015. The roadmap will describe the most important activities to be undertaken in order to facilitate automated driving trials and to prepare for increasing vehicle automation.

The Ministry has also developed a plan for promoting intelligent automation in transport services. The first version of the plan was published in September 2015. It calls for creating a strong shared determination for Finland to become one of the world’s foremost actors in the field of intelligent automation of transport and to create and maintain an enabling regulatory framework that will make this development possible.

At the international level, Finland is actively working towards updating the UNECE Conventions on Road Traffic so that, in the future, they would allow for large-scale testing and use of self-driving vehicles and vehicle fleets.

1.1.7 Greece

The Greek Ministry of Infrastructure, Transport and Networks in cooperation with stakeholders in the country has begun discussion regarding the possibility of allowing driverless vehicles within the Greek transport network from 2013. The occasion for starting this discussion was the possible CITYMobil2 pilot in the Greek city of Trikala, involving automated public transport systems, including driverless vehicles. The discussion led to a consultation which has taken place in between the different ministry divisions and the involved parties (ICCS, e-Trikala). The ministry has encouraged discussion between all relevant actors in different European countries and for this conveyed a meeting on May 2014 in Athens with representatives from other ministries to discuss different approaches.
As an outcome a legislative act was voted on 11th of December 2014 by the Greek Parliament allowing pilot trials of automated vehicles in public roads, under specific conditions (which involve mainly a thorough analysis of the proposed routes, a certification process for the vehicles, a proper training for the operators (remote or on-board), a supervision by appropriate research or academic bodies and an active support by local authorities). These specific conditions were to be defined in detail in a ministerial decision that was published on June 13th 2015. Within this specific decision there are specific clauses that allow the operation of automated vehicles both with operators on-board or by supervising the proper operation through on-board cameras at a remote control center.

The first automated vehicles were officially licensed on October the 29th while they have been insured against third party liability (whilst insuring the operator and the passengers) and have been put on operation in the City of Trikala.

The CityMobil2 large-scale demonstration in Trikala (Greece) was officially launched by the municipality of Trikala during an opening ceremony on 10 November [8].

1.1.8 Belgium

The current Belgium law allows prototypes with driver to be tested on Belgian roads provided that the prototype is authorised to be tested. As a reminder, Belgium has been one of the countries at the origin of the modification of the Vienna convention to clarify that driving assisting systems are not contradictory to the principle of having constant control over the vehicle.

To allow testing of their prototypes on Belgian roads, manufacturers will need to go through a 2 steps process:

1. The Regional authority responsible for the road network will need to give its permission to let the vehicle driving on its road network. This permission will be granted after analysis of a file describing, among others, the test conditions. This file will need to contain all necessary information to allow the authority to make its opinion. In order to help the development of this file, the Belgian Federal administration in charge of transport is currently managing a group of experts aiming at developing a code of good practices. The Regions are associated in this process. The UK code of practice is used as basis for this work. This document should describe the conditions to be fulfilled and the procedure to be followed to allow a prototype vehicle to drive on Belgian roads. The document should be completed before end of 2015.

2. The Federal authority responsible for transport will need to give its permission to allow the prototype vehicle to drive on Belgian roads. This permission will be granted after analysis of the vehicle construction.

Belgian authorities are seeking to have a transparent approach with clear rules in order to encourage testing of such vehicles in Belgium in the coming months.

1.1.9 Spain

The Spanish DGT is expected to announce their strategy for the deployment of automated vehicles by the end of 2015.
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