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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A European strategy on Cooperative Intelligent Transport Systems, a first milestone towards cooperative, connected and automated mobility

1. INTRODUCTION

Profound change lies ahead for the transport sector; in Europe as much as in other parts of the world. A wave of technological innovation and disruptive business models has led to a growing demand for new mobility services. At the same time, it is responding to the pressing need of making transport safer, more efficient and sustainable. The resulting transformation bears huge social and economic opportunities that Europe must seize now, to secure its benefits to its citizens.

Digital technologies are one, if not the strongest driver and enabler of the transformation ongoing. Exchange of data between different actors in the transport system can match supply and demand in real time, leading to a more efficient use of resources, be it a shared car, a container or a rail network. Digital technologies help humans to make lesser errors, by far the greatest source of accidents in transport. They can also bring about a truly multimodal transport system which is driven by demand and integrates all modes of transport into one mobility service, letting people and cargo travel effortlessly from door to door.

The potential of digital technologies and related business models is particularly big in road transport, and so is the need to act. The steady, positive trend in road safety the EU has seen over the last decade, has slowed down. Road transport is still responsible for the bulk of transport emissions, in terms of greenhouse gases and air pollutants. Day by day, congested roads cause huge cost to the EU economy. With millions of Europeans depending for their job directly or indirectly on the automotive industry, it is critical that industry is provided with the conditions to stay in the lead globally.

The present Communication is thus closely linked to the political priorities of this Commission, notably its Agenda for Jobs, Growth and Investment, the Digital Single Market and the Energy Union Strategy. The European Strategy for Low-Emission Mobility adopted earlier this year, highlights the potential of cooperative, connected and automated vehicles to reduce energy consumption and emissions from transport. The Digitising European Industry Strategy[1] identifies cooperative, connected and automated vehicles as a priority topic for the competitiveness of European industry. Studies have estimated the market potential of cooperative, connected and automated driving to be dozens of billions annually and the creation of jobs could run in the hundreds of thousands[2].

In many aspects today's vehicles are already connected devices. But only in the very near future will they interact directly with each other and with the road infrastructure. This interaction is the domain of Cooperative Intelligent Transport Systems (C-ITS), which will allow road users and traffic managers to share and use information previously not available and to coordinate their actions. The cooperative element – enabled by digital connectivity – is expected to significantly improve road safety, traffic efficiency and comfort of driving, by helping the driver taking the right decisions and adapting his driving to the traffic situation.

The Commission is convinced that cooperation between vehicles is critical to master higher levels of automation. Connectivity, cooperation and automation are complementary, and will therefore evolve together: they both need, and reinforce each other. Truck Platooning (a number of trucks following each other, mutually communicating to automatically keep a very short distance) is a good example. All three capabilities must come together to make it work.

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[1] COM(2016) 180, SWD(2016) 110

[2] Roland Berger, autonomous driving, Think:Act, December 2014
AT Kearney, Roadmap towards Autonomous Driving, September 2015
KPMG, Connected and autonomous vehicles - the UK economic opportunity, March 2015

But even more so will cooperation be needed for automated vehicles to negotiate much more complex traffic situations in the future.

Countries around the world (e.g. US, Australia, Japan, Korea, China) are moving rapidly towards deployment of such technologies: in some cases vehicles and C-ITS services are already available on the market. G7 Transport Ministers[3] have repeatedly underlined the need for action. Several Member States have started C-ITS deployment activities under real life conditions through strategic alliances such as the EU cooperative corridor[4] linking Rotterdam to Frankfurt and Vienna, or the Amsterdam Group[5].

In April 2016, European Transport Ministers, in the Declaration of Amsterdam[6], urged the European Commission to develop a European strategy on cooperative, connected and automated vehicles. Equally important, industry stated its intention to start full scale deployment of C-ITS enabled vehicles in 2019[7]. But for this to happen, coordination is urgently needed at European level.

With technology rapidly evolving and public and private sector investing substantial amounts into developing and testing C-ITS technologies, there is a risk that, without a framework at European level, EU-wide interoperability will not be achieved on time. This would put European industry at a disadvantage vis à vis its competitors and delay the deployment of C-ITS in Europe, with its multiple benefits for transport and society at large.

To avoid a fragmented internal market and create synergies between different initiatives, this Communication presents a European framework for the coordinated deployment of C-ITS. It addresses all critical issues, including cyber-security, data protection and interoperability, and proposes actions at different levels, necessary to meet the target date. The Communication thereby delivers the first milestone of an EU strategy on connected, cooperative and automated vehicles.

[3] G7 Meeting in Germany, September 2015: G7 Declaration
G7 Meeting in Japan, September 2016: G7 Declaration
[4] Cooperative ITS Corridor
[5] Amsterdam Group
[6] Declaration of Amsterdam
[7] Car2Car Communication Consortium Press Releases, 10/2015

2. EUROPEAN ACTIVITIES TO ENABLE DEPLOYMENT

The Communication is the result of intensive work with experts from both public and private sectors. Since November 2014, the Commission has hosted the C-ITS Platform[8] to identify remaining barriers and propose solutions for C-ITS deployment in Europe. The first phase of the C-ITS Platform resulted in an expert report[9], which the platform participants unanimously endorsed in January 2016. This report, complemented by a Cost Benefit Analysis[10] and a public consultation[11], has laid the groundwork for the present initiative.

Substantial funding[12] has already been made available by the EU for cooperative, connected and automated vehicles. For more than fifteen years research and deployment projects have proved the feasibility of C-ITS services. More recently under Horizon 2020, research in Intelligent Transport Systems has shifted focus to the integration of transport modes and the links with automation. A dedicated call on automated road transport was launched in 2016. In the context of the Strategic Research and Innovation Agenda (STRIA), an R&I roadmap on connected and automated transport is being developed to steer and coordinate future R&I activities in Europe. This work is complemented by large scale deployment projects in the area of cooperative systems on the Trans-European Transport network in 13 countries[13], making use of EU funding programmes such as the Connecting Europe Facility (CEF).

Regarding vehicle automation, the Commission gathers active Member States' authorities and industry stakeholders within the High Level Group GEAR 2030 on the future of the automotive sector. [The work of this Group will feed into a Commission strategy planned for adoption by in 2017.] It will join work strands on cooperative, connected and automated vehicles and complement the present initiative from an *automotive* sector perspective. The results of the C-ITS Platform will feed into GEAR 2030, providing it with a more systemic perspective of the *transport system* as whole.

A High level dialogue involving the telecom and vehicle manufacturing industry launched in autumn 2015 provides a platform where both industries intend to develop synergies in the area of connected and automated vehicles. This allows the automotive sector to take advantage of digital developments such as the Internet of Things, Big Data, the telecoms policy and digitalisation of industry.

To make C-ITS deployment a success, an unprecedented level of cooperation across many sectors is required. Roles and responsibilities are blurring along the value chain. This may, for example, impact the liability towards end-users. Successful deployment will also depend on the capacity of public authorities to plan mobility in times of fast-changing markets.

Much of the greater need for cooperation is related to the development of digital infrastructure and the need to think in horizontal layers, cutting across sectors and industries, rather than in vertical silos. The focus can no longer be on infrastructure alone, consisting of roads and vehicles. To make full use of digital technologies, coordination is also needed for the data

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[8] The Platform for the Deployment of C-ITS in the European Union provides an operational instrument for dialogue, exchange of technical knowledge and cooperation amongst the Commission, public stakeholders from Member States, local/regional authorities and private stakeholders such as e.g. vehicle manufacturers, equipment manufacturers, road operators, telecom operators and service providers.

[9] Final Report of the C-ITS Platform

[10] Annexes of C-ITS Platform WG1

[11] Summary report of public consultation on C-ITS

[12] EU co-funding of over 130 Million EUR alone since 2014 through CEF and H2020

[13] AT, BE, CZ, DE, DK, ES, FI, FR, NL, NO, SE, SI, UK

layer which is created on top of the infrastructure, containing both static data such as digital maps or traffic regulations and dynamic data such as real-time traffic information. Using these data, a layer of services is currently being developed, which aggregate into innovative solutions for a safer, more efficient and sustainable transport system and add value to other sectors too, for instance the energy sector. To make best use of digital technologies and shape the multimodal transport system of the future, market access and fair competition on each of these layers needs to be ensured.

A more systemic approach also requires to look at potential social impacts (despite new jobs being created, traditional jobs in the transport sector might be negatively affected) and other possible rebound effects, limiting the positive impacts of new technologies. The full integration of cooperative, connected and automated vehicles into the concept of "Mobility as a Service", involving also public transport as well as logistics, and the move towards a low-emission transport system, have to be addressed at the same time.

3. SETTING OUT THE WAY TOWARDS C-ITS DEPLOYMENT IN 2019

Taking into account the recommendations of the C-ITS Platform[14], the Commission has identified issues which must be tackled at EU level to ensure coordinated deployment of C-ITS services by 2019. The following chapters propose specific actions to address each of them, including enabling conditions at European, Member States, public authorities and industry level.

3.1. Priorities for deployment of C-ITS Services

The Commission is of the opinion that availability of C-ITS services across the EU for end-users, so called 'continuity of service', is the most important factor for swift deployment of C-ITS in Europe. From the start, services deployed must be available as widely as possible, on the side of infrastructure and vehicles. Therefore, this initiative sets priorities for a coordinated deployment of harmonised C-ITS services by Member States and industry.

At the request of the Commission, the C-ITS Platform has analysed the costs and benefits of deploying C-ITS enabled services for road transport in the Member States[15]. To this end the Platform discussed the most promising deployment scenarios in terms of rapid and widespread uptake and translated them into numerous input parameters for the EU-wide cost-benefit analysis.

It has been established that C-ITS services – when deployed in an interoperable way across Europe – produce a Benefit Cost Ratio (BCR) of up to 3 to 1 based on cumulative costs and benefits from 2018 to 2030: every Euro invested in C-ITS should generate up to 3 Euro in

[14] According to the final report of the C-ITS platform these are:
- A "day one" list of commonly agreed C-ITS services for deployment across the EU.
- A common vision to tackle cyber security detailed in an agreed Trust Model.
- An assessment of C-ITS benefits across Europe, based on a hybrid communication approach with a kick start for road safety related services based on 'ITS-G5' communication technology and an open architecture allowing to integrate cellular communication where and when available and considered appropriate.
- Guiding principles for access to in-vehicle data. Further legal and technical analyses and the development of scenarios based on the cost benefit assessment of the different possible technical solutions is needed. The results of a dedicated Commission study will be available mid of 2017.
- A detailed analysis regarding privacy and data protection, which constitutes a sound basis for further work on privacy by design as well as the implementation of the new requirements stemming from the new General Data Protection Regulation.

[15] Files available within Annexes of C-ITS Platform WG1

benefits. One of the reasons is that marginal cost of adding ever more services and C-ITS enabled vehicles should gradually decrease over time. It is anticipated that by 2030 the BCR will reach 6 to 1 and continues growing after that date. The cost benefit analysis has demonstrated that deployment should start as quickly as possible and the rapid deployment of as many services as possible also leads to faster break-even and higher overall benefits, mainly due to the network effect (which means that slow initial uptake rates would result in relatively long periods with little benefits).

Based on this work, the Commission recommends that a list of technologically mature and highly beneficial C-ITS services should be deployed quickly to let end-users and society at large benefit of C-ITS as quickly as possible. This early deployment list is defined below as the *Day 1 C-ITS Services List*. In a second phase, the *Day 1.5 C-ITS Services List* would be deployed. This list is characterised by services for which full specifications or standards might not be completely ready for large scale deployment from 2019, even though they are considered to be generally mature and expected to be highly beneficial for society. Respondents from the public consultation evaluated all these services positively for early deployment.

Day 1 C-ITS Services List
Hazardous location notifications: Slow or stationary vehicle(s) & Traffic ahead warning; Road works warning; Weather conditions; Emergency brake light; Emergency vehicle approaching; Other hazardous notifications **Signage applications** In-vehicle signage; In-vehicle speed limits; Signal violation / Intersection Safety; Traffic signal priority request by designated vehicles; Green Light Optimal Speed Advisory (GLOSA); Probe vehicle data; Shockwave Damping (falls under ETSI Category "local hazard warning")
Day 1.5 C-ITS Services List
Information on fuelling & charging stations for alternative fuel vehicles; Vulnerable Road user protection; On street parking management & information; Off street parking information; Park & Ride information; Connected & Cooperative navigation into and out of the city (1st and last mile, parking, route advice, coordinated traffic lights); Traffic information & Smart routing

Specific actions

- Member States, vehicle manufacturers, road operators and ITS industry should implement C-ITS and ensure that at least the list of Day 1 C-ITS Services is fully supported.
- The Commission will support Member States and industry in making use of EU funding and financing instruments, notably the Connecting Europe Facility (CEF), European Structural and Investment Funds (ESIF) and the European Fund for Strategic Investments (EFSI) for deployment of the Day 1 C-ITS Services.
- The Commission will provide funding for research and innovation through H2020 for Day 1.5 and beyond C-ITS services including higher levels of automation.
- The Commission will support the update of the Lists of Day 1.5 and future C-ITS Services, leading to higher levels of vehicle automation and better road safety through the continuation of the C-ITS Platform process.

3.2. Security of C-ITS communications

As the transport system is becoming more and more digitised, it may also become more vulnerable to hacking and cyber-attacks. Cyber security of C-ITS communications is therefore critical, and it requires action at European level. Without clear, common rules, C-ITS deployment in the EU will be delayed as investors are looking for a common approach for the internal market. Also, fragmented security solutions will put interoperability and the safety of end-users at risk.

Supported by the recommendations of the C-ITS platform, the Commission therefore believes a common security and certificate policy[16] for C-ITS deployment in Europe needs to be developed. This relies on the strong political support for a uniform and widely accepted security solution for cooperative and connected vehicles, and related public infrastructure elements, in Europe.

To develop and establish an EU-wide security framework, based on Public Key Infrastructure technology (PKI[17]), for vehicles and public infrastructure elements, including a compliance assessment process all stakeholders need to be involved. A key challenge will therefore be to set up the necessary governance at EU, national and industry levels involving all main stakeholders, including public authorities (e.g. transport ministries and the responsible national security associations), road operators, vehicle manufacturers, C-ITS station suppliers and C-ITS station operators. Developing a common security solution for deployment and operation of C-ITS in Europe will in turn lay the foundation for stronger security at higher levels of automation (including vehicle to vehicle and vehicle to infrastructure communication).

Specific actions

- The Commission will steer the development of a common security and certificate policy for deployment and operation of C-ITS in Europe, together with all relevant stakeholders in the C-ITS domain and will publish guidance regarding the European C-ITS security and certificate policy in 2017.
- All European C-ITS deployment initiatives should clearly commit to this process implementing future proof C-ITS services in Europe as of start of operations.
- The Commission will analyse the roles and responsibilities regarding a common trust model in Europe, and whether some operational functions and governance related roles need active Commission involvement (e.g. like in the case of the Digital Tachograph[18]).

[16] The common security and certificate policy documents will for instance define the European C-ITS Trust model based on Public Key Infrastructure. They will, amongst others define legal, organisational or technical requirements for the management of public key certificates for C-ITS applications based on the structures identified in (IETF) RFC 3647.

[17] In this context, a public key infrastructure (PKI) is the combination of software, asymmetric cryptographic technologies, processes, and services that enable an organization to secure C-ITS communications. For an introduction to PKI concepts, see NIST-800-32

[18] The Digital Tachograph is a recorder of professional drivers' activities (rest and driving hours). It provides trustworthy information to EU enforcers controlling compliance with Social Regulation (EC) No 561/2006: https://dtc.jrc.ec.europa.eu/. A new version of the Digital Tachograph (Smart Tachograph) has been defined with Regulation (EC) No 165/2014.

3.3. Privacy and data protection safeguards

Privacy and data protection rights are determining factors for the successful deployment of cooperative, connected and automated vehicles. Users must have the assurance that personal data is not a commodity, but they can effectively control how it is being used and what for.

The Commission is of the opinion that data broadcast by C-ITS from vehicles must be considered as personal data. Therefore safeguard measures are necessary and are being set up for the implementation of C-ITS. These measures need to comply with the relevant legal base for the different processing operations of this data and in any case, system deployed within the EU market needs to comply fully with the recently adopted General Data Protection Regulation[19], including where necessary, the obtaining of consent from end-users. Data protection and privacy by design and default principles and data protection impact assessment are of central importance in the basic C-ITS system layout and engineering, especially in the context of the applied communication security scheme. The responses in the public consultation indicate that when these conditions are met consent to broadcast is not an overwhelming barrier, in particular when the data is used to enhance road safety or improve traffic management.

Specific actions

- C-ITS service providers should offer clear terms and conditions to drivers, using clear and plain language in an intelligible way and in easily accessible forms, enabling them to give their freely informed consent to any processing of their personal data.
- The Commission will publish first guidance regarding "data protection and privacy by design and by default" related to C-ITS in 2018.
- The European C-ITS deployment initiatives should:
  - work on information campaigns to create the necessary trust of end-users and achieve general public acceptance;
  - demonstrate the positive impacts on the transport system (e.g. safety, efficiency) while ensuring data protection compliance and privacy;
  - develop, in consultation with EU Data Protection Authorities, a sector based Data Protection Impact Assessment template to be used for the introduction of new C-ITS applications.

3.4. Communication technologies and frequencies

C-ITS messages will be transmitted for a wide range of services, in various transport environments and between different actors. Generally, drivers do not care what communication technology is used to transmit C-ITS messages, but will increasingly expect to receive all information on traffic and safety conditions seamlessly across Europe. This can only be achieved by combining the benefits from a mix of complementary communication technologies, called the hybrid communication approach.

To support all C-ITS services on the vehicle side, the full hybrid communication mix needs to be on-board. On the infrastructure side the choice of communication technology will depend on the location, the type of service and cost efficiency. C-ITS messages should be agnostic about the communication technology used, easing the inclusion of future technologies (e.g. 5G[20]) into the hybrid communication mix.

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[19] Regulation (EU) 2016/679

[20] COM(2016)588: 5G for Europe: An Action Plan and accompanying SWD(2016)306

Currently, the most promising hybrid communication mix is a combination of ETSI ITS-G5 and existing cellular networks. This ensures the best possible support for deployment of all Day 1 C-ITS services. It combines low latency for time-critical safety related C-ITS messages with wide geographical coverage and access to large user groups.

In 2008 the Commission designated a dedicated frequency band for safety related applications[21]. Initial deployment for short range vehicle-to-vehicle and vehicle-to-infrastructure communication will be based on 'ETSI ITS-G5' using this band. To safeguard existing and future safety related applications from harmful interference, co-existence with applications using adjacent bands or the same spectrum needs to be ensured. Adequate mitigation techniques need to be defined and implemented (e.g. the co-existence with tolling) and spectrum allocation should be assessed carefully (e.g. the proposed Radio Local Area Network extension into this frequency band).

The respondents from the public consultation give widespread support for the hybrid communication approach, less than 5% disagrees with initial deployment based on ETSI ITS-G5 and the vast majority sees an important role for 5G in the long-term.

Specific actions

- Road authorities, service providers, vehicle manufacturers and industry should adopt a strategy for hybrid communication - in procurement and serial production - in order to support the full Day 1 C-ITS Services List.
- Telecom operators that support C-ITS services should implement the appropriate management of network load for road safety related C-ITS applications.
- The Commission will support the continued designation of frequencies used by ETSI ITS-G5 for traffic safety related applications and all measures to protect this frequency band from harmful interference, in Europe and internationally at ITU/CEPT level.
- The European C-ITS deployment initiatives should implement the relevant mitigation techniques for co-existence according to ETSI standards and procedures.

3.5. Interoperability at all levels

An integrated transport system relies on the interoperability of its components. That means that systems need to be able to interact with each other, across borders and transport modes, at all levels: infrastructure, data, services, applications and networks.

While standardisation activities are a necessary condition, they are not sufficient to ensure interoperability alone. Therefore EU wide deployment specifications have to be defined and agreed upon. This includes that the applicable EU standards[22] are understood and applied in the same way in all European C-ITS deployment initiatives, taking into account concrete implementation needs and processes.

To this end, C-ITS deployment initiatives within the EU should define and publish the technical C-ITS communication profiles needed for interoperability of Day 1 C-ITS Services. In addition they should develop test procedures to check the interoperability of these profiles. Ensuring mutual access to communication profiles will ensure sharing of best practises and lessons learned from real life testing, including cross-site tests. It should also lead to a gradual convergence of profiles, creating the conditions for EU-wide interoperability. The aim is to

[21] Decision 2008/671/EC - on the harmonised use of radio spectrum in the 5 875-5 905 MHz frequency band for safety-related applications of Intelligent Transport Systems (ITS)
[22] M/453 (2009)

enable a large C-ITS market in Europe based on common communication profiles, which at the same time leaves space for future innovative services.

Member States, supported by the Commission, launched the C-Roads Platform[23] to link C-ITS deployment activities, jointly develop and share technical specifications and to verify interoperability through cross-site testing. Initially created for C-ITS deployment initiatives co-funded by the EU, C-Roads is open to all other deployment activities for interoperability testing.

Specific actions

- The Commission will make full use of the C-Roads Platform as the coordination mechanism for C-ITS deployment at implementation level.
- Member States should join the C-Roads platform for testing and validation, to ensure interoperability for Day 1 C-ITS Services across the EU.
- C-ITS deployment initiatives should complete their C-ITS communication profiles and publish them together with the testing and applicable validation standards.
- C-Roads partners should start developing system tests based on the common communication profiles within one year from project start and give full access to third parties and industry players. Industry stakeholders should use these opportunities for validation to help create a single European market for C-ITS and continuity of services for end users.

3.6. Compliance assessment

To ensure the deployment of seamless Day 1 C-ITS Services an effective compliance assessment framework that allows services to be checked against EU wide system requirements is needed. Especially for road safety related applications, there is a strong public interest in developing such a framework for key elements of the C-ITS network such as security, privacy or interoperability, to ensure that drivers receive consistent warnings in different traffic environments across the EU.

The first step for setting up such a framework will be to define common minimum requirements for the deployment of Day 1 C-ITS Services. These minimum requirements will then need to be evaluated and validated by all relevant stakeholders. This will supply the needed basis to jointly develop a fully-fledged compliance assessment process for Day 1 C-ITS Services. This is also a prerequisite for either the introduction of new services (e.g. Day 2 and beyond) or the extension of existing services into new areas of application, e.g. fully automated vehicles and their communications.

An important guiding principle for all future implementation activities is that they need to be compliant on both the infrastructure and vehicle side with the full Day 1 C-ITS Services List.

Specific actions

- The European C-ITS deployment initiatives should define a compliance assessment process for the Day 1 C-ITS Services List and publish it for full access by third parties.
- The Commission will support the deployment initiatives in developing fully-fledged common compliance assessment process for all key elements ensuring the continuity of C-ITS services and taking into account potential service extensions.

[23] The C-Roads Platform is co-funded under the Connecting Europe Facility (CEF)

3.7. Legal certainty

If the EU wants to deploy by 2019 the Day 1 C-ITS Services this Communication identifies, investments and regulatory frameworks need to converge across Europe. Given the rapid development of technology and the complexity of the issues at stake, the right mix of instruments is needed to make this happen. The Commission believes that a feedback loop between the C-ITS deployment initiatives and the C-ITS Platform, including best practise for regulation, is a key enabler of learning by experience.

As a result of this process, and in close cooperation with all stakeholders, the Commission will consider using the ITS Directive 2010/40/EU[24] and other instruments to ensure legal certainty in areas where a coherent set of rules at EU level is needed to create a single market for cooperative, connected and automated vehicles. The Directive gives a clear mandate to deal with matters of linking vehicles and the transport infrastructure.

In addition other legal instruments might be considered, e.g. for compliance assessment processes. The public consultation showed that 70% of respondents are in favour of Commission action to support both in-vehicle communication equipment and deployment of selected C-ITS services.

Specific actions
The Commission will consider, where appropriate, making use of the mandate of the ITS Directive to adopt delegated act(s) by 2018

- ensuring continuity of C-ITS services
- laying down rules to ensure security of C-ITS communications
- ensuring the practical implementation of the General Data Protection Regulation in the area of C-ITS
- ensuring a forward looking hybrid communication approach
- laying down rules on interoperability
- laying down rules on the compliance assessment processes

3.8. International cooperation

International cooperation in the area of cooperative, connected and automated vehicles is fundamental as markets are developing globally. Governments have an interest in learning from each other to find the best approach and ensure swift deployment of the new technologies. Industry too has a strong interest in international cooperation, since it is looking to global markets when developing equipment, services and business models.

The EU has already benefitted from cooperation with Australia, Japan, Singapore and US in areas such as research, security and harmonisation of standards. The EU should remain engaged with international partners to continue benefitting from their experiences, especially those gained from large scale deployment initiatives.

The G7 process has developed into an important arena for coordination and harmonisation at international level. Recently the G7 Transport Ministers agreed on two declarations to support the early commercialisation of connected and automated vehicle technologies, agreeing to further cooperate on all aspects related to the safe and effective deployment. This includes

[24] The Commission is preparing the extension of the time frame of the mandate to adopt delegated acts under the ITS Directive 2010/40/EU.

promoting international standardisation, ensuring data protection and cyber security, addressing legal aspects and enabling the coordination of research.

Specific actions

- The Commission will promote the harmonisation and coordination of C-ITS development and deployment in cooperation with international partners and initiatives.
- The Commission will continue engaging in the twinning of Horizon 2020 research and innovation projects in the field of ITS with similar projects in third countries.

4. CONCLUSION

The coordinated and rapid deployment of cooperative, connected and automated vehicles in road transport urgently requires EU action. If successful, it will make an important contribution to improving road safety, increasing the efficiency of road transport, and ensuring the competitiveness of EU industry.

With this strategy the Commission reaches the first milestone in creating a European strategy for the deployment of cooperative, connected and automated vehicles, as called for in the Declaration of Amsterdam. Together with other road initiatives envisaged for adoption by the Commission in 2017, this strategy contributes to shaping the EU's road transport system of the future and to overcoming the key challenges it faces today. The actions needed to achieve this goal and timeline have been identified and require a joint effort by all actors involved.

All stakeholders, including Member State and local authorities, vehicle manufacturers, infrastructure operators, telecom and service providers are called upon to work together to make EU-wide deployment of C-ITS in Europe a reality from 2019 onwards. The Commission will ensure synergies and coherence between ongoing and future initiatives and support the leading position of Europe in the field of cooperative, connected and automated vehicles.

The Commission invites the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions to endorse this Communication and urges all actors to actively engage and make its implementation a success through collaboration at all levels and across sectors.