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RADIO SPECTRUM COMMITTEE

Working Document

Subject: Mandate to CEPT to study the extension of the Intelligent Transport Systems (ITS) safety-related band at 5.9 GHz

**Opinion of the RSC
pursuant to Advisory Procedure under Article 4 of Regulation 182/2011/EU and
Article 4.2 of Radio Spectrum Decision 676/2002/EC**

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1. PURPOSE

The underlying objective of this Mandate is to provide the Commission with the necessary information to consider the amendment of Commission Decision 2008/671/EC, of 5 August 2008, 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).

In particular, the purpose of this mandate is to study the possibility of:

- Extending the upper edge of the EC harmonised safety-related ITS band (5 875-5 905 MHz) by 20 MHz up to 5 925 MHz.
- In addition to road transport, allowing other means of transport such as Urban Rail¹ (using Communication Based Train Control, (CBTC)) in the EC harmonised safety-related ITS band.

2. EU POLICY CONTEXT

Mobility has an important role in modern day society and substantially impacts our lives and the EU economy. Among the top challenges are road safety (over 26 000 people died on European roads in 2015²), the environmental impact (road transport is the main responsible for Nitrogen Oxides (NOx) emissions in the EU)³, economic concerns (every day, congested roads are a huge cost to the EU economy), and the global competitive position of the EU automotive and rail industry.

In line with the Declaration of Amsterdam, endorsed by Transport Ministers in April 2016⁴, the Commission has announced in the 2017 work programme⁵ its intention to work in an integrated way on mobility, connectivity and the future of the automotive industry.

In order to cater for vehicle connectivity in terms of access to spectrum for safety-related ITS applications, the European Commission adopted Decision 2008/671/EC, which has facilitated standardisation and development of equipment. Recent developments described below have led the Commission to consider an amendment of Decision 2008/671/EC.

¹ This type of communication encompasses urban and suburban usages which shall be taken into due consideration when conducting relevant studies.

² https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/observatory/trends_figures.pdf

³ <https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-air-pollutants-8/transport-emissions-of-air-pollutants-4>

⁴ <https://www.regjeringen.no/contentassets/ba7ab6e2a0e14e39baa77f5b76f59d14/2016-04-08-declaration-of-amsterdam---final1400661.pdf>

⁵ https://ec.europa.eu/commission/work-programme-2017_en

In its Opinion on Intelligent Transport Systems⁶, the RSPG considers that *"There is no evidence that spectrum availability is currently a constraint on the development of ITS, and there is no immediate need to take regulatory action in this regard. However, given the momentum of policy and standardization development for ITS we recommend that the options for ITS to expand to share spectrum for safety-related ITS in the 20 MHz above the existing designation and, for non-safety ITS, in the 20 MHz below, should be kept available for the time being"*.

ITS in the Automotive industry

The automotive industry is making substantial progress in view of EU-wide deployment of ITS in 2019. ITS will contribute to connected and driverless vehicles, notably for safety-related applications. The Commission notes the appreciation of continued EU support expressed by EATA, the European Automotive Telecom Alliance at the round table co-chaired by Vice President Andrus Ansip and Commissioner Günther Oettinger at the Mobile World Conference on 27 February 2017 and the progress made at the latest round-table of 15 September 2017⁷. Furthermore, an MoU⁸ on cooperation in the field of connected and autonomous driving solutions has been signed between EATA and the 5G Automotive Association (5GAA). Also an MoU⁹ between C-Roads¹⁰ and the Car2Car Communication Consortium (C2C-CC) has been signed at the ITS Europe Congress preparing the deployment of initial cooperative ITS services across Europe by 2019.

One of the recent developments in the ITS scenario is the standardisation of an LTE-based V2X (vehicle to everything) technology¹¹ which could underpin the path to 5G connectivity for the automotive/road transport "vertical" sector. This technology however will be commercially available later than the existing IEEE 802.11p "G5" Wi-Fi based ITS technology¹². Various initiatives are on-going in Europe towards implementation in vehicles of the G5 technology which has been subject of European R&D¹³ since several years. However, stakeholders appear quite divided as regards the

⁶ https://circabc.europa.eu/sd/a/b30590d7-5190-480b-b1d1-def24719e061/RSPG17-008-Final_opinion_ITS.pdf

⁷ <https://ec.europa.eu/digital-single-market/en/node/88557>

⁸ https://www.eurofiber.nl/assets/uploads/2017/02/EATA_5GAA_MOU_final-for-signature-20170227.pdf

⁹ <https://www.c-roads.eu/platform/about/news/News/entry/show/c-its-cooperation-between-c2c-cc-and-c-roads-platform-1.html>

¹⁰ <https://www.c-roads.eu/platform.html>

¹¹ 3GPP Release 14 (direct communication interface, PC5).

¹² In line with the C-ITS Strategy COM(2016) 766, the ITS Directive 2010/40/EU and subject to investments in 16 EU Member States to implement C-ITS based on the principles of the "C-ROADS" platform.

¹³ <https://ec.europa.eu/transport/sites/transport/files/themes/its/doc/c-its-platform-final-report-january-2016.pdf>

choice among the above technologies as was demonstrated at the recent workshop held by the Commission on 5 September 2017¹⁴.

ITS projects in the EU

EU Member States in the C-Roads project are deploying C-ITS based on the ETSI ITS-G5 technology as of 2017 for road infrastructure¹⁵. A total of 350 million EUR are earmarked in 16¹⁶ Member States to implement C-ITS based on the principles of the “C-Roads position on the usage of the 5.9 GHz band” and on the Release 1 of the ETSI ITS-G5 System Profile¹⁷ while new CEF initiatives¹⁸ are in addition to ETSI ITS-G5 and existing long-range cellular communication also studying LTE-V2X technology.

In line with the EU principle of technology neutrality in spectrum regulation, the existing Decision 2008/671/EC already allows the use of any technology that falls within the definition of ITS in compliance with the applicable harmonised standard (EN 302 571 published in the OJEU on 9 June 2017¹⁹).

Thus the 5.9 GHz band offers spectrum for V2V(I) in a technology neutral way and licence-exempt use of this band is recommended by CEPT taking into account coexistence with other co-primary radio communication services. Based on current technology development and the applicable harmonised standard, a G5-only vehicle and an LTE-only vehicle do not communicate with each other.

Outside the scope of this mandate, Industry should actively engage in European Standardisation Organisations and with Member State authorities in order to identify the best way forward to achieve interoperability between various systems in this band.

Further work leading to coexistence and efficient spectrum use of safety-related car-to-car/infrastructure operation in the designated 5.9 GHz band (e.g. through shared use) should be undertaken in ETSI and CEPT, as appropriate.

¹⁴ <https://ec.europa.eu/digital-single-market/en/news/workshop-short-range-vehicular-communications-59-ghz-band>

¹⁵ For details on ITS-G5 deployment per country, see https://www.c-roads.eu/fileadmin/user_upload/media/Dokumente/c-roads-flyer_2.pdf

¹⁶ Austria, Belgium, Czech Republic, France, Germany, The Netherlands, Slovenia, United Kingdom, Denmark, Finland, Hungary, Italy, Norway, Portugal, Spain and Sweden.

¹⁷ www.c-roads.eu

¹⁸ e.g. the CONCORDA project that was selected in a recent CEF-Transport evaluation and is currently in the contract signature phase.

¹⁹ http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2017.180.01.0005.01.ENG&toc=OJ:C:2017:180:TOC

ITS in the urban rail sector

Urban Rail (such as metros, trams, light trains) consists of public transport systems permanently guided by at least one rail, intended for the operation of local, urban and suburban passenger services segregated or not from general road and pedestrian traffic. Some of those systems (in particular metros and suburban rail lines) increasingly use Communication Based Train Control (CBTC)²⁰, often also for Unattended (driverless) Train Operations (UTO). The operational characteristics of this application qualify it for using spectrum in the frequency range between 5 and 6 GHz. Today, a variety of proprietary Urban Rail systems exist in various frequency bands and some are already in operation in a part of the 5 905-5 925 MHz band, sometimes reserved by national administrations for such a radio application. In support of more harmonisation, the UITP (Union Internationale des Transports Publiques) has worked within ETSI to adopt a Technical Report (ETSI TR 103 111), the System Reference Document (SRDoc) on: *"Spectrum requirements for Urban Rail Systems in the 5.9 GHz range"*²¹.

Considerations on a possible prioritization²² between the various ITS applications are taking place in various fora including in ETSI and CEPT: for example, as an initial proposal, the road ITS may have priority in the 5875-5905 MHz band over urban rail ITS, while urban rail may have priority in the 5 905-5 925 MHz band over road ITS. In this regard, it is important to study the coexistence of urban rail applications and in particular CBTC with ITS solutions for safety-related road ITS (LTE-V2X and IEEE 802.11p "ETSI ITS-G5") in the 5.9 GHz band. Mitigation techniques developed through ETSI standardisation should be accompanied by technical conditions for spectrum access and relevant harmonised standards, in a technology neutral approach.

Decision 2008/671/EC on ITS specifies in Article 2(1): *"'Intelligent Transport Systems' mean a range of systems and services, based on Information and Communications technologies, including processing, control, positioning, communication and electronics, that are applied to a road transportation system;"*.

Therefore, besides expanding the frequency band for safety-related ITS, it would be necessary to amend this legal definition in order to include safety-related rail applications in the ITS category. This is supported by the aforementioned Opinion of the RSPG, which set outs that it *"is also important to take into account the developments in ITS technologies [...] and the introduction of Communication Based Train Control (CBTC) within the ITS designation. We recognise the risk that this could constrain other potential future uses of this spectrum (e.g. RLAN) and recommend that this risk is kept under review"*.

Considering that the 5.9 GHz band is likely to be used by different technologies for safety-related transport systems (for road and rail such as ETSI ITS-G5, LTE-V2X and technologies for CBTC) each having its own merit, and observing the EU spectrum policy principle of technology neutrality, the Commission services take the

²⁰ In addition to current operational CBTC lines, a large number of projects have been already recorded on operators' side for operational CBTC service (see <http://www.urbanrail.net/eu/euromet.htm>).

²¹ http://www.etsi.org/deliver/etsi_tr/103100_103199/103111/01.01.01_60/tr_103111v010101p.pdf

²² Prioritization does not imply spectrum fragmentation (exclusivity) and is technology neutral.

view that there are sufficient grounds to study the possibility of expanding the 5 875-5 905 MHz band by 20 MHz upwards and pending the results and subsequent discussions in the RSC to amend Article 2(1) of Decision 2008/671/EC in order to expand the definition of safety-related ITS beyond road transportation based on the result of studies in response to this EC mandate.

3. JUSTIFICATION

Taking into account the RSPG Opinion, the evolving work of ETSI and the wider cooperation among stakeholders, the EU regulatory framework on the harmonised use of radio spectrum for safety-related applications of Intelligent Transport Systems (Commission Decision 2008/671/EC) should be reviewed in order to cope with multiple technologies and increased traffic management requirements.

It is important to note that the potential spectrum expansion is not intended to support segmentation and segregation between technologies and applications within the same band and thus to compensate for any cases of inefficient spectrum use. Technology neutrality and efficient spectrum use are important regulatory principles. They, together with uncompromised safety and the introduction in the longer-term of 5G for the further development of CCAM, are the four principles to be followed at EU level.

Pursuant to Article 4(2) of the Radio Spectrum Decision²³ the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum necessary for the functioning of the internal market. Such mandates shall set the tasks to be performed and their timetable.

4. TASK ORDER AND SCHEDULE

To support the policy objectives presented above, CEPT is mandated to carry out the following technical tasks:

Task 1 Study the possibility to extend the 5 875-5 905 MHz frequency band to the range 5 875-5 925 MHz for use by safety-related road and rail²⁴ ITS systems under harmonised technical conditions including *sharing* conditions. In this context, study measures which allow coexistence of LTE-V2X and Urban Rail ITS (such as technologies for CBTC already in operation in the 5 905-5 925 MHz frequency band) with existing ETSI ITS-G5²⁵ within the 5 875-5 925 MHz frequency band.

²³ Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJL 108 of 24.4.2002

²⁴ This type of application encompasses urban and suburban usages which shall be taken into due consideration when conducting relevant studies.

²⁵ See also foot note 12. There are investments based on ETSI ITS G5 in 16 EU Member States under the C Roads platform.

Task 2 In relation to Task 1, assess the suitability of the existing harmonised technical conditions applicable to the 5 875-5 905 MHz frequency band for use by Urban Rail ITS (such as technologies for CBTC); amend these conditions, if necessary, so as to develop consistent technical, including *sharing*, conditions for the whole 5 875-5 925 MHz frequency band. This should not result in segmentation and segregation of the band. The principle of equal access to shared spectrum shall be applied taking into account the need to avoid harmful interference and the need for reliable safety-related operation in the whole band.

Under tasks 1 and 2, the work will need to verify under which conditions ITS for Urban Rail can share the band with ITS for road transportation so as to facilitate the reliable safety-related operation of ETSI ITS-G5, LTE-V2X and technologies for CBTC in the whole band. CEPT should work in cooperation with ETSI, as appropriate.

In the work carried out under the Mandate, the general and specific policy objectives of the Radio Spectrum Policy Programme (RSPP) such as effective and efficient spectrum use and support for specific Union policies take utmost account of the applicable EU law and support the principles of service and technological neutrality, non-discrimination and proportionality insofar as technically possible.

CEPT should provide deliverables under this Mandate according to the following schedule:

Delivery date	Deliverable	Subject
March 2018	Interim Report from CEPT to the Commission	Description of work undertaken and interim results.
November 2018	Draft Report from CEPT to the Commission	Description of work undertaken and provisional results.
March 2019	Final Report from CEPT to the Commission, taking into account the outcome of the public consultation.	Description of work undertaken and final results.

CEPT is requested to report on the progress of its work pursuant to this Mandate to all meetings of the Radio Spectrum Committee taking place during the course of the Mandate.

The Commission, with the assistance of the Radio Spectrum Committee and pursuant to the Radio Spectrum Decision, may consider timely applying the results of this mandate in the EU, pursuant to Article 4 of the Radio Spectrum Decision, taking into account that initial ITS deployment is foreseen for 2019.