CEPT Report 91

Report from CEPT to the European Commission in response to the Mandate

Additional mandate to the CEPT on updating harmonised technical conditions for introducing wider frequency channels in the EU-harmonised 5.9 GHz frequency band for road safety-related applications of intelligent transport systems (ITS)

Report approved on 7 November 2025 by the ECC

0 EXECUTIVE SUMMARY

This CEPT Report addresses the response to the Additional Mandate from the European Commission to CEPT (Annex 1) to update harmonised technical and operational conditions, taking advantage of relevant studies and specifications already accomplished in the CEPT and ETSI, to introduce enhanced use cases for the use of radio spectrum for road safety-related applications of intelligent transport systems (ITS), in the 5875-5935 MHz ('5.9 GHz') frequency band, which are based on a wider spectrum channel in line with the latest technology evolutions.

Following the ETSI System Reference document TR 103 853 [1], CEPT amended ECC Decision (08)01 [2] to allow the use of a 20 MHz channel bandwidth in the frequency band 5875-5925 MHz for road safety-related ITS while maintaining appropriate protection of existing services within the 5875-5935 MHz frequency band and in adjacent bands. CEPT considers that for Road ITS the unwanted emissions, the total power and the power spectral density (PSD) limits applicable for a 10 MHz channel bandwidth are also applicable to a 20 MHz channel bandwidth, and that the conclusions on compatibility of Road ITS with other services and applications in the 5875-5925 MHz band as well as in adjacent bands also remain valid for a 20 MHz channel bandwidth.

Therefore, CEPT recommends the amendments to the Commission Decision (EU) 2020/1426 [3] proposed in section 3 considering the below:

- For Road ITS, two blocks of a 10 MHz channel can be combined to one contiguous 20 MHz channel;
- Pending the availability of solutions ensuring protection of Urban Rail ITS in the 5915-5925 MHz frequency band, the use of 20 MHz channel formed by 2 blocks of 10 MHz between 5905-5925 MHz can be used but limited to infrastructure to vehicle (I2V) communications noting that restrictions apply for Road ITS in the 5915-5925 MHz frequency band in accordance with the priority defined in article 3.3 of Commission Decision (EU) 2020/1426 on ITS;
- Compatibility between Road ITS and Fixed Service (FS) in 5925-6425 MHz is feasible if Road ITS unwanted emissions in that band are limited to -30 dBm/MHz (see ECC Report 228 [6]).

TABLE OF CONTENTS

0 EXECUTIVE SUMMARY 2

1 INTRODUCTION 5

2 EVOLUTION OF ITS SPECTRUM REGULATION 6
2.1 Coexistence considerations between ITS and other services and applications 6

3 RECOMMENDED AMENDMENTS TO THE REGULATORY FRAMEWORK 7

4 CONCLUSIONS 9

ANNEX 1: CEPT MANDATE 10

ANNEX 2 LIST OF REFERENCES 13

LIST OF ABBREVIATIONS

Abbreviation	Explanation
CEPT	European Conference of Postal and Telecommunications Administrations
e.i.r.p.	equivalent isotropically radiated power
ETSI	European Telecommunications Standards Institute
EC	European Commission
EU	European Union
FS	Fixed Service
I2V	Infrastructure to vehicle
ITS	Intelligent Transport Systems
ITU	International Telecommunication Union
PSD	Power spectral density
TPC	Transmit Power Control
WAS/RLAN	Wireless Access System including Radio Local Area Network

1 INTRODUCTION

This CEPT Report has been prepared in response to the additional Mandate from the European Commission (Annex 1), taking into account that the update is to be complementary and compatible with the existing regulatory framework for the harmonised use of the 5875-5925 MHz frequency band in accordance with the Commission Decision (EU) 2020/1426 [3] and maintains appropriate protection of existing services within the 5875-5935 MHz frequency band and in adjacent bands.

This CEPT Report addresses the evolution of ITS spectrum regulation in section 2. Section 3 contains the proposed amendments of the harmonised technical and operational conditions for the use of 20 MHz channels for safety-related Road ITS in the 5875-5925 MHz band in line with the amended ECC Decision (08)01 [2].

2 EVOLUTION OF ITS SPECTRUM REGULATION

On 7 October 2020, the Commission adopted Commission Implementing Decision (EU) 2020/1426 on the harmonised use of radio spectrum in the 5875-5935 MHz ('5.9 GHz') frequency band for safety-related applications of the intelligent transport systems (ITS) [3]. This Decision is based on the CEPT Report 71 [4] on "ITS at 5.9 GHz" of 11 March 2019 in response to the Commission mandate to the CEPT adopted in October 2017.

The current spectrum regulatory framework for ITS in the 5.9 GHz band has been developed based on compatibility studies conducted within ECC Report 101 [5], ECC Report 228 [6], ECC Report 290 [7] and ECC Report 291 [8]. These studies established technical conditions to ensure coexistence between Road ITS, Urban Rail ITS, Fixed Services (FS) and other users in adjacent bands.

Following the ETSI System Reference Document TR 103 853 [1] on wider channels for Road ITS, CEPT amended ECC Decision (08)01 [2] while maintaining the technology-neutral approach. The European Commission also issued an additional Mandate to CEPT in 2025, requesting the update of harmonised technical conditions to allow for 20 MHz wide channels in 5875-5925 MHz for Road ITS applications (see Annex 1).

This CEPT Report addresses the response to the additional EC Mandate on updating the harmonised technical and operational conditions in line with the amended ECC Decision (08)01.

2.1 COEXISTENCE CONSIDERATIONS BETWEEN ITS AND OTHER SERVICES AND APPLICATIONS

CEPT considered that for Road ITS the unwanted emissions, total power, and power spectral density (PSD) limits applicable to a 10 MHz channel bandwidth remain unchanged for a 20 MHz channel bandwidth. Consequently, the conclusions on compatibility for Road ITS with other services and applications within the band, as well as in adjacent bands, remain valid for 20 MHz channels. In particular, compatibility between Road ITS and Fixed Service (FS) in 5925-6425 MHz is feasible if Road ITS unwanted emissions in that band are limited to -30 dBm/MHz e.i.r.p. (see ECC Report 228 [6]).

In addition, CEPT Report 87 [9] defined technical conditions for Wireless Access System including Radio Local Area Networks (WAS/RLANs) operating above 5935 MHz to address the protection of safety-related urban rail ITS applications below 5935 MHz and safety-related Road ITS below 5925 MHz (e.g. out-of-band emission limit requirements and blocking scenario).

3 RECOMMENDED AMENDMENTS TO THE REGULATORY FRAMEWORK

The proposed amendments to the harmonised technical and operational conditions for the usage of frequency channels of 20 MHz in the 5875-5925 MHz frequency band for safety-related applications of road intelligent transport systems (ITS) in line with the revised ECC Decision (08)01 (updated in March 2025) [2] are as follows.

Amendments on the technical Annex:

Table 1: Technical parameters for safety related applications of intelligent transport systems in the 5 875-5 935 MHz band

Parameter	Value
Maximum spectral power density (mean e.i.r.p.)	23 dBm/MHz
Maximum total transmit power (mean e.i.r.p.)	33 dBm with ~~a~~ transmit power control (TPC) ~~range of at least 30 dB~~ TPC shall be able to reduce the total power from its maximum to 3 dBm e.i.r.p.

Table 2: Technical parameters specific to road ITS operating in 5875-5925 MHz

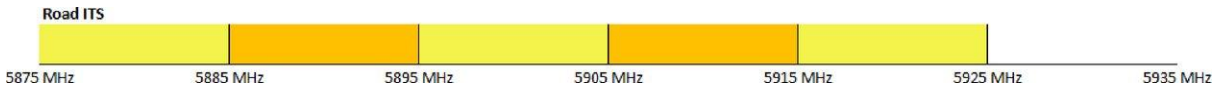
Parameter	Value
Unwanted emissions above 5 925 MHz	≤ -30 dBm/MHz e.i.r.p.

Techniques to access spectrum and mitigate interference that provide an appropriate level of performance shall be used in line with Directive 2014/53/EU of the European Parliament and of the Council[1]. If relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the *Official Journal of the European Union* under Directive 2014/53/EU, performance at least equivalent to the performance level associated to those techniques shall be ensured.

Frequency arrangement

The frequency arrangement is based on block sizes of 10 MHz starting at the lower edge of the band, at 5 875 MHz.

For road ITS:



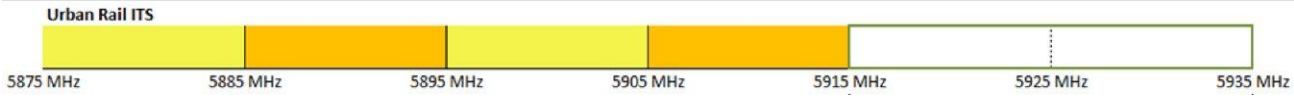
In the 5 875-5 925 MHz band, road ITS applications shall use channels within the boundaries of each 10 MHz block. Channel bandwidth may be less than 10 MHz.

Two blocks can be combined to one contiguous 20 MHz channel.

The 20 MHz channel formed by 2 blocks of 10 MHz between 5 905-5 925 MHz can be used but limited to infrastructure to vehicle (I2V) communications, noting that restrictions apply to 5 915-5 925 MHz in accordance with the priority defined in article 3.3 (of Commission Implementing Decision (EU) 2020/1426).

[1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC (OJ L 153, 22.5.2014, p. 62).

For urban rail ITS:



In 5 875-5 915 MHz, urban rail ITS applications shall use channels within the boundaries of each 10 MHz block. Channel bandwidth may be lower than 10 MHz.

In 5 915-5 935 MHz, the maximum channel bandwidth shall be 10 MHz for urban rail ITS applications. The dotted line shows the preferred harmonised frequency arrangement but, at national level, rollouts may use a channel centred at 5 925 MHz.

4 CONCLUSIONS

The main findings of this Report are presented in the Executive Summary (section 0).

ANNEX 1: CEPT MANDATE

EUROPEAN COMMISSION
Communications Networks Content & Technology Directorate-Ge

Ref. Ares(2025)560137 – 24/01/2025

Digital Decade and Connectivity
Radio Spectrum Policy

ADDITIONAL MANDATE TO THE CEPT ON UPDATING HARMONISED TECHNICAL CONDITIONS FOR INTRODUCING WIDER FREQUENCY CHANNELS IN THE EU-HARMONISED 5.9 GHZ FREQUENCY BAND FOR ROAD SAFETY-RELATED APPLICATIONS OF INTELLIGENT TRANSPORT SYSTEMS (ITS)

1. PURPOSE

The purpose of this mandate to the CEPT is to update harmonised technical and operational conditions, taking advantage of relevant studies and specifications already accomplished in the CEPT and ETSI, to introduce enhanced use cases for the use of radio spectrum for road safety-related applications of intelligent transport systems (ITS), in the 58755935 MHz ('5.9 GHz') frequency band, which are based on a wider spectrum channel in line with the latest technology evolutions. This mandate must be considered additional to the Mandate of 2017 to study the extension of the Intelligent Transport Systems (ITS) safety-related band at 5.9 GHz.

2. BACKGROUND

On 7 October 2020, the Commission adopted Commission Implementing Decision (EU) 2020/1426 on the harmonised use of radio spectrum in the 5875-5935 MHz ('5.9 GHz') frequency band for safety-related applications of the intelligent transport systems (ITS). This Decision is based on the CEPT Report 71 on "ITS at 5.9 GHz" of 11 March 2019 in response to the Commission mandate to the CEPT adopted in October 2017.

CEPT Report 71 addressed the tasks of the 2017 Commission mandate to study the extension of the safety-related band for Intelligent Transport Systems (ITS) at 5.9 GHz. Regarding co-channel coexistence solutions for road ITS, in its letter of 8 March 2024[2] to the European Commission, the CEPT highlighted that coexistence between road ITS technologies is outside the remit of CEPT, in line with the current regulatory framework, that does not favour specific technologies, as set out in Commission Decision (EU) 2020/1426. Regarding co-channel coexistence solutions between urban rail ITS and road ITS, the CEPT should continue to work in cooperation with ETSI, as appropriate, in order to take account of relevant developments, when available, of ETSI specifications and standards. This matter is intentionally excluded from the present mandate, as it is still considered in ETSI and potentially necessitates an additional update from CEPT under the Commission Mandate of 2017. Pursuant to the aforementioned CEPT letter, CEPT may

[2] ECC(24)027Annex18

provide additional updates on any other relevant topic within the remit of the Commission Mandate of 2017.

The recent update of the ITS framework in the CEPT, which was triggered by ETSI[3], supports the possibility to also use 20 MHz wide channels in the frequency sub-band 5875- 5925 MHz designated to road ITS applications. The availability of such wider channels for road ITS, in addition to the currently harmonised 10 MHz channels, will allow the deployment of both basic and advanced use cases. It should provide advantages such as flexibility with different road ITS use cases, simplification of implementation and spectrum efficiency, while maintaining a technology neutral approach. The current priority between road ITS and urban rail ITS as established by current Decision (EU) 2020/1426 shall remain unchanged.

Therefore, it is appropriate to amend the EU regulatory framework to accommodate this development, thus also ensuring its alignment with the CEPT framework.

3. JUSTIFICATION

Pursuant to Article 4(2) of the Radio Spectrum Decision[4] the Commission shall 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.

Taking into account the recent relevant work of the CEPT and ETSI on 20 MHz channels for road ITS and close cooperation with stakeholders, the EU regulatory framework on the harmonised use of radio spectrum for safety-related applications of Intelligent Transport Systems (Commission Decision (EU) 2020/1426) should be updated.

In the work carried out under this mandate, the overall policy objectives of the Radio Spectrum Policy Programme (RSPP) such as effective and efficient spectrum use and ensuring appropriate spectrum resources for specific Union policies, including intelligent transport safety and management systems (s. Art. 8(1)), shall be given utmost consideration. In implementing this mandate, the CEPT shall, whenever relevant, 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.

4. TASK ORDER AND SCHEDULE

In fulfilment of the objectives presented above, the CEPT is mandated to carry out the following technical tasks:

[3] ETSI SRdoc TR 103 853.

[4] Decision No 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, OJ L108, 24.4.2002, p. 1

Task

Update the harmonised technical and operational conditions for the usage of frequency channels of 20 MHz in the 5875-5925 MHz frequency band for safety-related applications of **road** intelligent transport systems (ITS), in support of both, basic and advanced use cases. Those conditions must:

- be complementary to and compatible with the existing regulatory framework for the harmonised use of the 5875-5925 MHz frequency band in accordance with the Commission Decision (EU) 2020/1426;
- maintain appropriate protection of existing services within the 5875-5935 MHz frequency band and in adjacent bands.

The CEPT should work in cooperation with ETSI, as appropriate.

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

Delivery date	Deliverable	Subject
June 2025	Draft Report from CEPT to the Commission	Description of the work undertaken and provisional results.
November 2025	Final Report from CEPT to the Commission.	Description of the work undertaken and final results.

The CEPT is requested to report on the progress of its work pursuant to this mandate to all meetings of the Radio Spectrum Committee (RSC) taking place during the course of the mandate.

Electronically signed on 24/01/2025 09:20 (UTC+01) in accordance with Article 11 of Commission Decision (EU) 2021/2121

ANNEX 2: LIST OF REFERENCES

[1] ETSI TR 103 853 “System Reference document (SRdoc); Road ITS equipment operating in the 5,9 GHz band with channel bandwidths larger than 10 MHz”

[2] ECC Decision (08)01: “the harmonised use of the 5875-5925 MHz frequency band for Intelligent Transport Systems (ITS)”, approved March 2008 latest amended 7 March 2025

[3] Commission implementing Decision (EU) 2020/1426 of 7 October 2020 on the harmonised use of radio spectrum in the 5 875-5 935 MHz frequency band for safety-related applications of intelligent transport systems (ITS) and repealing Decision 2008/671/EC

[4] CEPT Report 71: “Report from CEPT to the European Commission in response to the Mandate to study the extension of the Intelligent Transport Systems (ITS) safety-related band at 5.9 GHz”, approved March 2019”

[5] ECC Report 101: “Compatibility studies in the band 5855-5925 MHz between Intelligent Transport Systems (ITS) and other systems”, approved February 2007

[6] ECC Report 228: “Compatibility studies between Intelligent Transport Systems (ITS) in the band 5855-5925 MHz and other systems in adjacent bands”, approved January 2015

[7] ECC Report 290: “Studies to examine the applicability of ECC Reports 101 and 228 for various Intelligent Transport Systems (ITS) technologies under EC Mandate (RSCOM 17-26Rev.3)”, approved January 2019

[8] ECC Report 291: “Compatibility studies between smart tachograph, weight&dimension applications and systems operating in the band 5795-5815 MHz and in the adjacent bands”, approved January 2019

[9] CEPT Report 87: “Report from CEPT to the European Commission in response to the Mandate to review the limit of out-of-band (OOB) Emissions below 5935 MHz applicable to Very Low Power (VLP) WAS/RLAN devices, approved November 2024