



ECC Decision (08)01

The harmonised use of Safety-Related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band¹

approved 14 March 2008

latest amended 7 March 2025

¹ Comparable technical specifications to those given in this ECC Decision are given in Commission Decision 2008/671/EC. EU Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the Commission Decisions

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This ECC Decision addresses frequency designation within the band 5875-5935 MHz for the harmonised implementation of safety-related Intelligent Transport **Systems (ITS)**.

Throughout this ECC Decision where the term ITS is used, it is related to safety-related ITS unless otherwise stated.

ITS encompass Road ITS and Urban Rail ITS. Road ITS include any kind of ground-based transportation systems, e.g. cars, trucks, bicycles, motor bicycles, tramways, pedestrians, constructions equipment, agricultural equipment, etc. Urban Rail ITS mean urban or suburban railway lines segregated from road and pedestrian traffic.

The objective of frequency designation for road safety applications in the 5.9 GHz band is to support the European Union Vision Zero initiative with its goals to reduce the number of road fatalities and to improve the efficiency of road traffic by using ITS.

Road ITS traffic safety and efficiency communications encompass Infrastructure to Vehicle (I2V) and Vehicle to Vehicle (V2V) communications between ITS stations. Throughout this ECC Decision, portable ITS stations are also covered by the terminology “vehicle”, when V2V or I2V is addressed.

The frequency designation in the 5.9 GHz band is also for Urban Rail ITS, such as Communication-Based Train Control (CBTC) systems, providing wireless automatic train control with and without driver.

2 BACKGROUND

The use of the frequency band 5855-5925 MHz for Road ITS has been considered within compatibility studies documented in ECC Report 101 [2], ECC Report 228 [3], ECC Report 290 [4] and ECC Report 291 [5].

In 2005, the frequency band 5875-5925 MHz was identified by ETSI within their System Reference Document TR 102 492-1/2 [7] as the most suitable frequency band for development and deployment of Road ITS providing road safety and traffic efficiency applications all over Europe.

In October 2017, the EC issued a Mandate to CEPT [10] to study the extension of the ITS safety-related band at 5.9 GHz. CEPT Report 71 [1] provided the response to this EC Mandate. The outcome was the extension of the upper edge of the EC harmonised safety-related ITS band (5875-5905 MHz) by 20 MHz up to 5925 MHz, as well as a further extension of the safety-related ITS band from 5925 to 5935 MHz for Urban Rail ITS. It was noted that in some CEPT countries Road ITS were using frequencies in 5875-5905 MHz and Urban Rail ITS frequencies in 5905-5975 MHz.

In 2023, ETSI provided their System Reference Document TR 103 853 [15] requesting a revision of radio spectrum regulation for Road ITS operating in 5.9 GHz enabling channels with 20 MHz bandwidth.

The CEPT/ECC compatibility studies addressed in ECC Report 101 compatibility in the band 5855-5925 MHz between ITS and other systems and concluded that Road ITS will not suffer from excessive interference resulting from other systems/services, that compatibility between the Fixed-Satellite Service (FSS) satellite receiver in 5850-6725 MHz and Road ITS is feasible, taking into account that ITS devices in a given area do not all transmit at the same time, and that compatibility between the Broadband Fixed Wireless Access (BFWA) in 5725-5875 MHz and Road ITS is achieved.

ECC Report 228 [3] addressed compatibility studies between ITS in the frequency band 5855-5925 MHz and other systems in adjacent bands and concluded that compatibility with the Fixed Service (FS) in the 5925-6425 MHz band is achieved if Road ITS unwanted emissions in that band are limited to -30 dBm/MHz *e.i.r.p.* The Report also concluded that protection of road tolling in the 5795-5815 MHz band is achieved if Road ITS unwanted emissions remain below -65 dBm/MHz *e.i.r.p.* inside a defined zone. Alternatively, higher unwanted

emissions could be allowed together with mitigation techniques equivalent to those described in ETSI TS 102 792 v1.1.1 [13].

ECC Report 290 [4] addressed compatibility studies to examine the applicability of ECC Reports 101 and 228 for various ITS technologies and concluded that for Urban Rail ITS compatibility with FS and road tolling is feasible. However, in case of proximity to road tolling communication zones or situations where the FS beam is pointing towards the Urban Rail ITS tracks, an adequate system design for CBTC may be required and coordination may be required between Urban Rail ITS and road tolling when the separation distance is below 40 m. The outcomes of ECC Report 101 [2] related to the compatibility with FSS were considered valid.

ECC Report 291 [5] addressed the compatibility between smart tachograph, weight & dimension applications and systems operating in the band 5795-5815 MHz and in the adjacent bands, and concluded that it is only close to the remote early detection communication reader (REDCR) where Road ITS unwanted emissions may cause interference. Compatibility with ITS was feasible with an unwanted emissions limit of -30 dBm/MHz *e.i.r.p.*, also assuming ITS message generation equivalent to those described in ETSI EN 302 637-2 [16].

ECC Report 228 [3], ECC Report 290 [4] and ECC Report 291 [5] assumed a typical Road ITS duty cycle when transmitting CAM of 1% over 1 hour, with a duty cycle of 2% over 1 hour in some studies where message retransmissions (one retransmission of a CAM) are implementation specific.

ECC Report 302 [6] and ECC Report 355 [17] addressed compatibility studies between WAS/RLAN in 5925 - 6425 MHz and Urban Rail ITS in 5915-5935 MHz.

3 REQUIREMENT FOR AN ECC DECISION

The allocation or designation of frequency bands for use by a service or system under specified conditions in CEPT administrations is laid down by law, regulation or administrative action. ECC Decisions are required to deal with radio spectrum related matters and the carriage and while in use of radiocommunication equipment throughout Europe. The harmonisation on a European basis supports the Directive 2014/53/EU [11] 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. A commitment by CEPT administrations to implement an ECC Decision will provide a clear indication that the required frequency bands will be made available on time and on a European-wide basis.

ECC DECISION OF 14 MARCH 2008 ON THE HARMONISED USE OF SAFETY-RELATED INTELLIGENT TRANSPORT SYSTEMS (ITS) IN THE 5875-5935 MHz FREQUENCY BAND (ECC DECISION (08)01), AMENDED 3 JULY 2015, AMENDED 6 MARCH 2020, UPDATED 18 NOVEMBER 2022 AND AMENDED 7 MARCH 2025

“The European Conference of Postal and Telecommunications Administrations,

considering

- a) that Directive 2010/40/EU [12] for the deployment of Intelligent Transport Systems (ITS) in the field of road transport and for interfaces with other modes of transport was adopted;
- b) that the status of safety service in No. **1.59** of the ITU Radio Regulations is not applicable to safety-related ITS;
- c) that ITS encompass Road ITS and Urban Rail ITS;
- d) that safety-related ITS are being deployed across CEPT within the band 5875-5935 MHz;
- e) that, in some CEPT countries, Urban Rail ITS are currently using frequencies in the range 5905-5975 MHz;
- f) that the radiolocation service in 5250-5850 MHz operates immediately adjacent to Wireless Access Systems including Radio Local Area Networks (WAS/RLAN), which means that the much lower unwanted emissions from ITS are negligible in comparison;
- g) that Fixed Service (FS) links are widespread above 5925 MHz in some CEPT countries, and therefore Road ITS are not considered above 5925 MHz;
- h) that studies concluded that compatibility between ITS and Fixed Service (FS) in 5925-6425 MHz is feasible if ITS unwanted emissions in that band are limited (ECC Report 228 [3]);
- i) that coordination with FS may be needed when deploying Urban Rail ITS in 5925-5935 MHz (ECC Report 290 [4]);
- j) that studies concluded that in-band compatibility between ITS and FSS is feasible, taking into account the limited number of ITS devices that transmit at the same time (ECC Report 101 [2] and ECC Report 290 [4]);
- k) that the message generation rules of Road ITS can contribute to mitigate interference from ITS;
- l) that technical coexistence studies concluded that compatibility with road tolling operating in 5795 - 5815 MHz within a defined “protection zone” was achieved with an ITS unwanted emissions below -65 dBm/MHz *e.i.r.p.* without mitigation techniques, or alternatively -45 dBm/MHz *e.i.r.p.* together with mitigation techniques equivalent to those in described in ETSI TS 102 792 v1.1.1 [13] (ECC Report 228 and ECC Report 290);
- m) that studies concluded compatibility between Road ITS and smart tachograph, weight & dimension applications, but in certain conditions unwanted emissions from Road ITS may affect these applications (ECC Report 291 [5]);
- n) 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 band as well as in adjacent bands also remain valid for a 20 MHz channel bandwidth;
- o) that ETSI EN 302 571 [8] including Road ITS equipment sets requirements regarding the protection of existing services in 5855-5925 MHz and in adjacent bands;
- p) that ITS devices cannot claim protection from Fixed Satellite Service (FSS) earth stations in the frequency band 5875-5935 MHz and administrations, when authorising new FSS transmitting earth stations, may consider the potential impact on ITS;

- q) that Urban Rail ITS receivers should be robust against WAS/RLAN emissions in 5945-6425 MHz, which are harmonised by ECC Decision (20)01 [14];
- r) that on a national basis, Road ITS applications for infrastructure to vehicle (I2V) communications may be permitted and coordinated with Urban Rail ITS in 5915-5925 MHz, and that vehicle-to-vehicle (V2V) communications will be possible in 5915-5925 MHz when solutions ensuring protection of Urban Rail ITS become available through standardisation in ETSI;
- s) that CEPT administrations may implement an individual authorisation regime for Urban Rail ITS in 5915-5935 MHz and for Road ITS infrastructure in 5915-5925 MHz in order to facilitate coexistence between Urban Rail ITS and Road ITS in 5915-5925 MHz as well as between Urban Rail ITS and Fixed Service above 5925 MHz;
- t) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the Directive 2014/53/EU [11]. Conformity with the essential requirements of the Directive 2014/53/EU may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the Directive 2014/53/EU;

DECIDES

1. that the purpose of this ECC Decision is to harmonise the use of safety-related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band;
2. that, for the purpose of this ECC Decision, the following definitions apply:
 - a) safety-related Road ITS are those applications whose aim is to reduce the number of traffic fatalities or accidents using communications between ITS stations;
 - b) safety-related Urban Rail ITS are wireless Automatic Train Control (ATC) applications used along urban or suburban railway lines segregated from road and pedestrian traffic²;
3. that CEPT administrations shall:
 - a) designate the frequency band 5875-5925 MHz on a non-exclusive basis for all safety-related ITS and that Road ITS shall have priority below 5915 MHz and Urban Rail ITS shall have priority above 5915 MHz, so that protection is afforded to the applications having priority;
 - b) designate the frequency band 5925-5935 MHz on a non-exclusive basis for safety-related Urban Rail ITS, subject to national market demand for Urban Rail ITS and national circumstances including coordination with existing FS links;
 - c) allow free circulation and use of ITS equipment subject to the provisions of this Decision;
 - d) exempt all vehicle-installed and mobile ITS equipment subject to the provisions of this Decision from individual licensing;
 - e) exempt Road ITS road-side equipment subject to the provisions of this Decision from individual licensing in 5875-5915 MHz;
4. that the frequency arrangement defined in Annex 1 applies to safety-related ITS;
5. that the technical conditions in Annex 2 apply to safety-related ITS devices;
6. that Road ITS and Urban Rail ITS shall use their respective prioritised frequency range until co-channel sharing mechanisms are defined by ETSI, unless *considering r)* is applied on a national basis;
7. that the existing services in the ITS bands and in adjacent bands need to be protected;
8. that this Decision enters into force on 7 March 2025;

² Railway lines not segregated from road or pedestrian traffic (such as tramways) shall be considered as part of Road ITS.

9. that the preferred date for implementation of this Decision shall be 7 September 2025;
10. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC chairman and the Office when the Decision is nationally implemented.”

Note:

Please check the Office documentation database <https://docdb.cept.org/> for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: FREQUENCY ARRANGEMENT

The frequency arrangement is based on a block size of 10 MHz starting at the lower edge of the band at 5875 MHz.

For Road ITS:

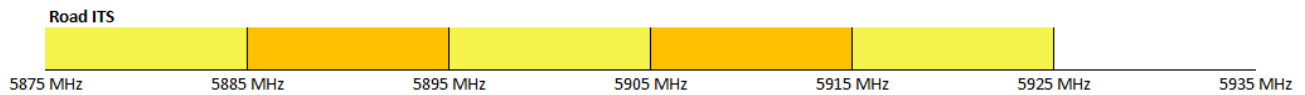


Figure 1: Frequency arrangement for Road ITS

Road ITS in 5875-5925 MHz shall use channels within the boundaries of each 10 MHz block. Channel bandwidth may be lower 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 5905-5925 MHz can be used but limited to I2V communications, noting that restrictions apply to 5915-5925 MHz in accordance with the priority defined in *decides 3a*.

For Urban Rail ITS:

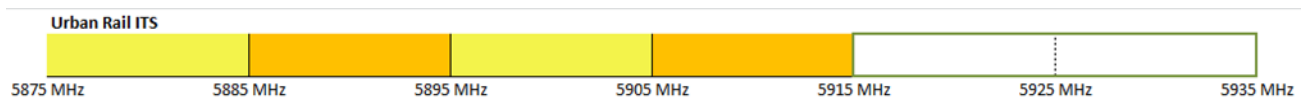


Figure 2: Frequency arrangement for Urban Rail ITS

Urban Rail ITS in 5875-5915 MHz shall use channels within the boundaries of each 10 MHz block. Channel bandwidth may be lower than 10 MHz.

In 5915-5935 MHz, the maximum channel bandwidth is 10 MHz for Urban Rail ITS. The dotted line shows the preferred harmonised frequency arrangement but, at national level, some rollouts may use a channel centred at 5925 MHz.

ANNEX 2: TECHNICAL CONDITIONS**A2.1 TECHNICAL CONDITIONS FOR ALL ITS DEVICES IN THE 5875-5935 MHz BAND****Table 1: Requirements on all ITS devices in the 5875-5935 MHz band**

	Technical conditions
Power spectral density	≤ 23 dBm/MHz <i>e.i.r.p.</i>
Transmit power	≤ 33 dBm <i>e.i.r.p.</i> with Transmit Power Control (TPC) TPC shall be able to reduce the total power from its maximum to 3 dBm <i>e.i.r.p.</i>

A2.2 SPECIFIC TECHNICAL CONDITIONS FOR ROAD ITS DEVICES**Table 2: Requirements specific to Road ITS devices**

	Technical conditions
Unwanted emissions above 5925 MHz	≤ -30 dBm/MHz <i>e.i.r.p.</i>

ANNEX 3: LIST OF REFERENCES

- [1] [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
- [2] [ECC Report 101](#): “Compatibility studies in the band 5855–5925 MHz between Intelligent Transport Systems (ITS) and other systems”, approved February 2007
- [3] [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
- [4] [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
- [5] [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
- [6] [ECC Report 302](#): “Sharing and compatibility studies related to Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) in the frequency band 5925-6425 MHz”, approved May 2019
- [7] ETSI TR 102 492-1/2: ETSI System Reference Document on “Intelligent Transport System; “Part 1: Technical characteristics for pan-European harmonized communications equipment operating in the 5 GHz frequency range and intended for critical road-safety applications”
“Part 2: Technical characteristics for pan European harmonized communications equipment operating in the 5 GHz frequency range intended for road safety and traffic management, and for non-safety related ITS applications”
- [8] ETSI EN 302 571: “Harmonised European Standard on “Intelligent Transport Systems (ITS); Radiocommunications equipment operating in the 5 855 MHz to 5 925 MHz frequency band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU”
- [9] ETSI TR 103 111: “System Reference Document on “Spectrum requirements for Urban Rail Systems in the 5.9 GHz range”
- [10] RSCOM17-26 rev3: “Mandate to CEPT to study the extension of the Intelligent Transport Systems (ITS) safety-related band at 5.9 GHz”, October 2017
- [11] 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 Text with EEA relevance
- [12] Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport Text with EEA relevance
- [13] ETSI TS 102 792: “Technical Specification on “Intelligent Transport Systems (ITS); Mitigation techniques to avoid interference between European CEN Dedicated Short Range Communication (CEN DSRC) equipment and Intelligent Transport Systems (ITS) operating in the 5 GHz frequency range”
- [14] [ECC Decision \(20\)01](#): “Harmonised use of the frequency band 5945-6425 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)”, approved November 2020, amended November 2024
- [15] 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”
- [16] ETSI EN 302 637-2: “Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service”
- [17] [ECC Report 355](#): “Measurement-based compatibility studies assessing interference from Very Low Power (VLP) Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operating in 5945-6425 MHz to Communication Based Train Control (CBTC) systems operating in 5915-5935 MHz”, approved May 2024