

# **Recommendation ITU-R M.2121-1**

## **(12/2023)**

M Series: Mobile, radiodetermination, amateur and related satellite services

## **Harmonization of frequency bands for Intelligent Transport Systems in the mobile service**



## Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

### Series of ITU-R Recommendations

(Also available online at <https://www.itu.int/publ/R-REC/en>)

Series	Title
<b>BO</b>	Satellite delivery
<b>BR</b>	Recording for production, archival and play-out; film for television
<b>BS</b>	Broadcasting service (sound)
<b>BT</b>	Broadcasting service (television)
<b>F</b>	Fixed service
<b>M</b>	<b>Mobile, radiodetermination, amateur and related satellite services</b>
<b>P</b>	Radiowave propagation
<b>RA</b>	Radio astronomy
<b>RS</b>	Remote sensing systems
<b>S</b>	Fixed-satellite service
<b>SA</b>	Space applications and meteorology
<b>SF</b>	Frequency sharing and coordination between fixed-satellite and fixed service systems
<b>SM</b>	Spectrum management
<b>SNG</b>	Satellite news gathering
<b>TF</b>	Time signals and frequency standards emissions
<b>V</b>	Vocabulary and related subjects

*Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

Electronic Publication  
Geneva, 2024

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## RECOMMENDATION ITU-R M.2121-1

**Harmonization of frequency bands for Intelligent Transport Systems  
in the mobile service**

(Question ITU-R 205-6/5)

(2019-2023)

**Scope**

This Recommendation provides guidance on harmonized frequency bands to be used by intelligent transport systems (ITS) pertaining to the exchange of information to improve traffic management and to assist safe driving. The Recommendation encourages administrations to use harmonized frequency bands throughout the ITU-R Regions for those ITS applications. Examples of the relevant frequency bands are provided in the Annex to this Recommendation.

**Keywords**

Intelligent Transport Systems (ITS)

**Abbreviations**

CEPT European Conference of Postal and Telecommunications Administrations

FSS Fixed satellite service

ITS Intelligent transport systems

**Related ITU Recommendations and Reports**

Recommendation ITU-R M.1452 – Millimetre wave vehicular collision avoidance radars and radiocommunication systems for intelligent transport systems applications

Recommendation ITU-R M.1453 – Intelligent transport systems – Dedicated short range communications at 5.8 GHz

Recommendation ITU-R M.1797 – Vocabulary of terms for the land mobile service

Recommendation ITU-R M.2084 – Radio interface standards of vehicle-to-vehicle and vehicle-to-infrastructure communications for Intelligent Transport System applications

Report ITU-R M.2228 – Advanced intelligent transport systems (ITS) radiocommunications

Report ITU-R M.2444 – Examples of Arrangements for Intelligent Transport Systems deployments under the mobile service

Report ITU-R M.2445 – Intelligent transport systems (ITS) usage

The ITU Radiocommunication Assembly,

*considering*

- a) that the growing radiocommunication needs of national and international road management can be satisfied through evolving intelligent transport systems (ITS);
- b) that national spectrum planning for ITS requires cooperation with other concerned administrations, in order to facilitate greater levels of spectrum harmonization;
- c) that usage of the same frequencies of the same service will enable administrations to benefit from harmonization while continuing to meet national planning requirements;
- d) the benefits of cooperation between countries providing effective transportation operations;

- e) that the use of ITS applications could improve traffic management, assist safe driving and support automated driving;
- f) that the benefits of spectrum harmonization for ITS are:
- increased potential for transportation operations, especially cross-border;
  - a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded equipment availability;
  - improved spectrum management and planning;
- g) the need for the development of harmonized frequency bands for the purposes of implementing ITS;
- h) that the designation of those harmonized frequency bands or parts thereof for ITS does not preclude the use of these bands/frequencies by any other application of the services to which they are allocated and does not establish priority in applying and using the Radio Regulations;
- i) that other land mobile systems may effectively complement ITS;
- j) that ITS is not intended to provide broadband connectivity to the drivers/passengers,  
*recognizing*
- a) that Report ITU-R M.2444 provides examples of arrangements for intelligent transport systems (ITS) deployments in certain regions and countries to assist in improving traffic management and safe driving;
- b) that a certain country in Region 3 operates an ITS system around 5.8 GHz as described in Recommendation ITU-R M.1453,  
*noting*
- a) that ITS are implemented under existing mobile-service allocations;
- b) that the frequency bands harmonized by this Recommendation are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations;
- c) that ITS applications are not understood as an application of a safety service (RR No. **1.59**);
- d) that spectrum planning for ITS is performed at the national level, taking into account the benefits of harmonized frequency bands used by neighbouring administrations;
- e) that flexibility, when using ITS, should be afforded to administrations to determine, at the national level, how much spectrum will be made available in order to meet their particular national requirements taking into account the existing applications and their evolution;
- f) that the protection of existing services needs to be ensured;
- g) that a certain country in Region 3 operates an evolving ITS system in 755.5-764.5 MHz;
- h) that some administrations in each of the three Regions have deployed radio local area networks in the frequency band 5 725-5 850 MHz and some administrations have allowed or are considering allowing radio local area networks in the frequency band 5 850-5 925 MHz, or parts thereof;
- i) that FSS earth station uplinks may create potential interference to ITS devices, especially in cases of operation in close proximity;
- j) that Administrations in CEPT have considered that ITS devices cannot claim protection from FSS earth station uplinks in 5 850-5 925 MHz in order to facilitate coexistence, in which case ITS devices deployed within CEPT need to cope with the interference created by FSS earth station uplinks,

*recommends*

- 1 that, taking into account *considering h*), Administrations should consider using the frequency band 5 850-5 925 MHz, or parts thereof, for current and future ITS applications;
- 2 that those examples of ITS frequency bands in current use, as listed in the Annex, should be considered for regional harmonized ITS frequency bands;
- 3 that when using harmonized frequency bands for ITS, potential coexistence issues between ITS stations and other applications of the mobile service and/or other services should be considered.

## Annex

### Examples of frequency usage for evolving ITS within Regions

<b>Region 1</b>	
<b>Country or Group</b>	<b>Frequency bands</b>
CEPT	5 855-5 925 MHz
United Arab Emirates	5 855-5 925 MHz
<b>Region 2</b>	
<b>Country or Group</b>	<b>Frequency bands</b>
Brazil	5 855-5 925 MHz
Canada	5 895-5 925 MHz
United States	5 895-5 925 MHz
<b>Region 3</b>	
<b>Country or Group</b>	<b>Frequency bands</b>
Australia	5 855-5 925 MHz
China	5 905-5 925 MHz
Japan	755.5-764.5 MHz 5 770-5 850 MHz
Korea	5 855-5 925 MHz
Singapore	5 855-5 925 MHz