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| **Radiocommunication Study Groups** |  |
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CHAPTER 1

Land mobile and fixed issues

(Agenda items 1.11, 1.12, 1.14, 1.15)

Agenda item 1.12

(**WP 5A** / **WP 4A**, **WP 4B**, **WP 4C**, **WP 5B**, **WP 5C**, **WP 5D**, **WP 7D**,
(WP 3K), (WP 6A), (WP 7B), (WP 7C))

*1.12 to consider possible global or regional harmonized frequency bands, to the maximum extent possible, for the implementation of evolving Intelligent Transport Systems (ITS) under existing mobile-service allocations, in accordance with Resolution* ***237 (WRC-15)****;*

Resolution **237 (WRC‑15)** – *Intelligent Transport Systems applications*

# 1/1.12/1 Executive summary

There is a need to consider harmonization of frequency bands for the implementation of evolving Intelligent Transport Systems (ITS).

Evolving ITS is being deployed to assist safe driving and to support transportation system efficiency and environmental sustainability. It is recognized that the frequency bands within existing mobile service allocations being used by evolving ITS systems may also be utilized by other applications and services.

Several ITU-R Reports and Recommendations have been developed in support of this agenda item, as listed in section 1/1.12/3.

ITU-R studies indicated that some administrations throughout the three Regions have designated the frequency band of 5 850-5 925 MHz, or parts thereof, for the deployment of ITS. Preliminary draft new Recommendation ITU-R M.[ITS\_FRQ], “Harmonization of frequency bands for Intelligent Transport Systems in the mobile service” recommends that several frequency bands, in whole or in part, be used for current and future ITS systems.

Three methods have been proposed to satisfy this agenda item:

− Method A: No change to the Radio Regulations because ITS continue to operate within existing mobile service allocations and the required harmonization of frequencies for ITS can be achieved through ITU‑R Recommendations and Reports.

− Method B: No change to the table of frequency allocations in the Radio Regulation, and add a new WRC Resolution to encourage administrations to use globally and regionally harmonized frequency bands for ITS applications.

− Method C: No change to the table of frequency allocations in the Radio Regulation, and add a new WRC Resolution to encourage administrations to use globally and regionally harmonized frequency bands for ITS applications by referring to the most recent version of Recommendation ITU-R M.[ITS\_FRQ].

For all Methods, Resolution **237 (WRC-15)** should be suppressed.

# 1/1.12/2 Background

Since 1995, research and development activities have been conducted in info-communication systems as core technologies of ITS. ITS, including legacy ITS systems have been deployed in some countries. Evolving ITS, including vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I) communications, vehicle-to-network (V2N) and vehicle-to-pedestrian (V2P) have been deployed in some countries to assist with safer driving. Communicating with moving vehicles is one of the typical use cases for radiocommunication, and a variety of ITS applications rely on radiocommunication technologies including the next generation of ITS applications.

Evolving ITS also becomes important in helping to reduce road traffic problems such as congestion and accidents. To address road safety and efficiency related matters, the ITS systems with vehicle-to-everything communication (e.g. WAVE, ETSI ITS-G5, LTE based V2X, ITS Connect) are studied in ITU-R.

Recognizing that harmonized spectrum and international standards would facilitate deployment of ITS radiocommunication, agenda item 1.12 was approved by WRC-15 to study the possible global or regional harmonized frequency bands for the implementation of evolving ITS under existing mobile-service allocations. The mobile service bands being used by the evolving ITS may also be utilized by other applications and services and some of the frequency bands are also being considered under other agenda items.

# 1/1.12/3 Summary and analysis of the results of ITU-R studies

Technical and operational studies performed by ITU-R in relation to agenda item 1.12 have indicated that the frequency band 5 850-5 925 MHz, or parts thereof, have been designated for the implementation of ITS systems by some administrations encompassing Regions 1, 2 and 3. Consequently, the ITU-R has developed preliminary draft new Recommendation ITU-R M.[ITS\_FRQ], “Harmonization of frequency bands for Intelligent Transport Systems in the mobile service” and working document toward a preliminary draft new Report ITU-R.[ITS\_USAGE], “Intelligent transport systems (ITS) usage in ITU Member States”.

View #1: It was indicated that there is potential for harmful interferences from FSS earth stations uplinks into ITS receivers. Consequently, some administrations in Region 1 have concluded that ITS stations cannot claim protection from FSS earth station uplinks in the 5 850-5 925 MHz frequency band.   In these cases, any coexistence issues between ITS stations and FSS earth station uplinks, may be mitigated by ITS equipment design; which would take into account the potential harmful interference from FSS earth stations.

View #2: Other views were also expressed that the frequency band 5 850-5 925 MHz is shared between the Mobile and FSS services on a co-primary basis and any coexistence issues in this band should be a national matter.

View #3: In regard with coordination between various services on a national basis, it is to emphasize that national issues are not dealt with by ITU-R due to the fact that national policy of a given administration on how to manage the use of radiocommunication services are associated with spectrum is a national matter and shall not be discussed internationally.

View #4: Some views were expressed that the probability of interference from ITS stations to FSS space receivers may be negligible.

## 1/1.12/3.1 ITU-R Recommendations and Reports

In ITU-R, several documents have been published, as follows: Recommendations [ITU-R M.1452-2](http://www.itu.int/rec/R-REC-M.1452/en), [ITU-R M.1453-2](http://www.itu.int/rec/R-REC-M.1453/en), [ITU-R M.1890[-1]](http://www.itu.int/rec/R-REC-M.1890/en), [ITU-R M.2084](http://www.itu.int/rec/R-REC-M.2084/en)[-1], and ITU-R M.[ITS.FRQ], and Reports [ITU-R M.2228](http://www.itu.int/pub/R-REP-M.2228) and ITU-R M.[ITS USAGE].

# 1/1.12/4 Methods to satisfy the agenda item

## 1/1.12/4.1 Method A – No change to the Radio Regulations and suppress Resolution 237 (WRC-15)

No change to the Radio Regulations other than to suppress Resolution **237 (WRC‑15)**.

**Reasons:** ITS operate within existing mobile service allocations. Harmonization of frequencies for ITS pertaining to the exchange of information to improve traffic management and to assist driving safety can be achieved through the course of ITU-R Study Group work by applicable ITU‑R Recommendations and/or Reports (e.g., Recommendation ITU-R M.[ITS\_FRQ]).

1.12/4.2 Method B – Add a new WRC Resolution

No change to the RR table of frequency allocations and to add a new WRC Resolution to encourage administrations to use globally or regionally harmonized frequency bands for ITS applications. Suppress Resolution **237 (WRC-15)**.

This method provides a regulatory framework for global harmonization for ITS applications through a new WRC Resolution.

## 1/1.12/4.3 Method C – Add a new WRC Resolution and non-mandatory reference to ITU‑R Recommendation

No change to the RR table of frequency allocations and to add a new WRC Resolution to encourage administrations to use globally and regionally harmonized frequency bands for ITS applications through reference to ITU-R Recommendation(s). Suppress Resolution **237 (WRC-15)**.

This method provides a regulatory framework for worldwide or regional harmonization for ITS applications through a new WRC Resolution and the most recent version of Recommendation ITU‑R M.[ITS\_FRQ].

# 1/1.12/5 Regulatory and procedural considerations

1/1.12/5.1 For Method A

NOC

ARTICLES

NOC

APPENDICES

SUP

RESOLUTION 237 (WRC-15)

Intelligent Transport Systems applications

1/1.12/5.2 For Methods B and C

ADD

draft new RESOLUTION [A112] (WRC-19)

Frequency bands for evolving Intelligent Transport Systems applications
under mobile service allocations

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

considering

*a)* that information and communication technologies are integrated in a vehicle system to provide evolving Intelligent Transport Systems (ITS) communication applications for the purpose of improving traffic management and assisting safer driving;

*b)* that there is a need for consideration of spectrum harmonization for evolving ITS applications, which are being used globally or regionally;

*c)* that there is a need to integrate various technologies, including radiocommunications, into land transportation systems;

*d)* that many new connected vehicles use intelligent technologies in the vehicles’ combined advanced traffic management, advanced traveller information, advanced public transportation management systems and/or advanced fleet management systems to improve traffic management;

*e)* that future vehicular radiocommunication technologies and ITS broadcast systems are emerging;

*f)* that some administrations have harmonized frequency bands for ITS radiocommunication applications;

*g)* that under certain circumstances FSS earth station and ITS stations may have operational issues while in close proximity;

*h)* that the compatibility between ITS stations and FSS space station is achievable for certain ITS station as an interferer,

recognizing

*a)* that harmonized spectrum and international standards would facilitate worldwide deployment of ITS radiocommunications and provide for economies of scale in bringing ITS equipment and services to the public;

*b)* 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;

c) 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 the guidelines for radio interface requirements of ITS are described in Recommendation ITU-R M.1890;

*b)* that outlines of technologies and characteristics for dedicated short-range communications at 5.8 GHz are described in Recommendation ITU-R M.1453;

*c)* that some administrations in each of the three Regions have deployed radiocommunication local area networks in the frequency band 5 725‑5 850 MHz and some administrations are considering allowing radiocommunication local area networks in the frequency band 5 850‑5 925 MHz;

*d)* that studies, feasibility tests, and actual operation of advanced ITS radiocommunications have been actively conducted towards the realization of traffic safety and a reduction of environmental impact as described in Report ITU-R M.2228;

*e)* that radio interface standards of vehicle-to-vehicle and vehicle-to-infrastructure communications for ITS applications are described in Recommendation ITU-R M.2084;

*f)* that ITS usage in ITU Member States is described in Report ITU-R M.[ITS USAGE];

*g)* that some Administrations in Region 1, within the spirit of Article **6**, have applied a coordinated approach by which when they deploy ITS stations, protection cannot be claimed from FSS earth station uplinks in 5 850‑5 925 MHz;

*h)* that the latest version of Recommendation ITU-R M.[ITS\_FRQ] provides frequency bands for ITS systems,

emphasizing

*a)*  that the provisions of Nos. **1.59** and **4.10** do not apply to ITS applications under mobile service allocations,

resolves

For Method B

to encourage administrations to use the frequency band 5 850-5 925 MHz, or parts thereof, when deploying ITS applications, taking into account *recognizing b)* while considering *recognizing c)* above;

For Method C

to encourage administrations to consider globally or regionally harmonized frequency bands or parts thereof, which are listed in the most recent version of Recommendation ITU-R M.[ITS\_FRQ], when planning and deploying ITS applications, taking into account *recognizing b)* above;

For both Methods B and C

invites Member States and Sector Members

to take into account, as necessary, possible coexistence issues between ITS stations and FSS earth stations operating in the 5 850-5 925 MHz frequency band,

invites Member States, Sector Members, Associates and Academia

to actively contribute to the ITU-R studies on ITS,

instructs the Secretary-General

to bring this Resolution to the attention of relevant international and regional organizations dealing with ITS.

*[NOTE: Upon the selection of Methods B or C, only the relevant parts should be kept in the draft new Resolution above.]*

SUP

RESOLUTION 237 (WRC-15)

Intelligent Transport Systems applications