

# **ELECTRONIC COMMUNICATIONS COMMITTEE**

ECC Decision  
of 14 March 2008  
on the harmonised use of the 5875-5925 MHz  
frequency band for  
Intelligent Transport Systems (ITS)

(ECC/DEC/(08)01)  
(2008/671/EC)



**EXPLANATORY MEMORANDUM****1 INTRODUCTION**

This CEPT/ECC Decision addresses frequency designation within the band 5875-5925 MHz for the harmonised implementation of Intelligent Transport Systems (ITS). The frequency band is allocated to the Mobile Service, the Fixed service and the Fixed-Satellite Service (Earth-to-space) on a primary basis in ITU Region 1 and in accordance with the European Common Allocation Table (ECA).

The objective of frequency designation for road safety applications in the 5.9 GHz band is to support the European Union eSafety initiative with its goals to reduce the number of road fatalities and improving the efficiency of road traffic with Intelligent Vehicle Safety Systems. ITS road safety and traffic efficiency systems in Europe are being developed within the 6<sup>th</sup> Framework programme of the European Union. The intelligent car is a flagship initiative of the i2010 policy of the European Union.

ITS road safety and traffic efficiency communication includes both Inter Vehicle Communication (IVC) and related Roadside to Vehicle (R2V) communication in highly dynamic ad hoc networks where the focus in some bands is on IVC in other bands on R2V communication. In order to support the time critical road safety applications where fast information exchange is necessary to warn and support the driver without time delay both IVC and R2V applications are necessary.

To support a quick development and deployment of ITS systems within a trans-European road network, it is essential that common frequency bands and associated harmonised equipment standards are available throughout Europe. A stable and permanent solution needs to be made available as soon as possible in order to support the European industry developments in this area.

The automotive industry in Europe has identified the frequency band 5875-5925 MHz for development and deployment of road safety and traffic efficiency applications from a propagation as well as from a technology availability point of view. CEPT/ECC studies regarding the necessary spectrum requirements for road safety and traffic efficiency within the 5.9 GHz band based on accepted traffic scenarios with both IVC and R2V communication have confirmed that a realistic estimate of the needed bandwidth is between 30-50 MHz including 20 MHz of bandwidth for time critical road safety applications.

The CEPT/ECC compatibility studies addressed in ECC Report 101 concludes that

- Between 5875 MHz and 5905 MHz ITS will not suffer from excessive interference resulting from other systems/services;
- Between 5875 MHz and 5925 MHz, ITS is compatible with all other services providing that their unwanted emissions levels are less than -55 dBm/MHz e.i.r.p. below 5850 MHz, less than -65 dBm/MHz e.i.r.p. below 5815 MHz and are less than -65 dBm/MHz e.i.r.p. above 5925 MHz.

Thus the compatibility studies have taken into account both sharing within the band 5875-5925 MHz required for ITS applications in Europe and services below 5875 MHz including the Radiolocation service below 5850 MHz as well as services above 5925 MHz including the Fixed Service.

The ECC Report 109 “on the aggregate impact from the proposed new systems (ITS, BBDR and BFWA) in the 5725-5925 MHz band on the other services/systems currently operating in this band” and ECC Report 110 “on compatibility studies between broad-band disaster relief (BBDR) and other systems” also relate to ITS.

The ECC Report 109 concludes that;

- The existing results of the different compatibility studies between each of the systems Broadband fixed wireless access (BFWA), Broadband Disaster Relief (BBDR), ITS and existing services will not be significantly changed by their aggregate impact;

The ECC Report 110 concludes that;

- If the band 5875-5925 MHz is used for BBDR radio applications, protection distances between ITS and BBDR could exceed several kilometres in both directions in the rural case whereas it is limited to hundred of metres in urban and suburban cases. Compatibility between BBDR and ITS may be improved by the use of appropriate mitigation techniques in that case.

It is essential for the implementation and deployment of ITS road safety and traffic efficiency applications in the CEPT countries and thus the possibility to meet the general European Union policies on road safety that a European harmonised solution on spectrum availability is adopted within the CEPT/ECC providing the necessary regulatory certainty for the ITS industry.

An ECC Decision making spectrum available for ITS within the band 5875-5925 MHz based on compatibility studies developed within the CEPT/ECC will also ensure that future Fixed and Mobile Service systems in this frequency band will have to prove their compatibility with ITS as well as with other existing services and applications in the band.

## **2 BACKGROUND**

The frequency band 5875-5925 MHz has been identified by ETSI within the system reference document TR 102 492-1/2 as the optimum frequency band for development and deployment of ITS providing road safety and traffic efficiency applications all over Europe.

The need for ITS data communication including IVC and R2V communication systems and a suitable frequency designation has been recognized for several years. These communication systems have been a topic in research for many years. Although many technical key challenges were solved in a number of research activities, IVC systems using ad hoc network technology have not been implemented in vehicles so far. The reason for this is the lack of appropriate frequency bands which grants effective protection for road safety applications and the lack of commercially cheap radio hardware. With the availability of the WLAN (IEEE 802.11) technology as a mass market product the technical and business requirements for ITS will be solved and the IEEE 802.11p for ITS equipment is now under development.

It is realised that spectrum identified for intelligent cooperative vehicles will require allocation on a harmonised European basis in order to be operated in all member states. It is also necessary to standardise communication protocols to ensure cross-border interoperability for the various applications envisaged as part of the European transport policies. Global harmonisation enhances economies of scale in equipment manufacture and would result in a wider cross-border mobility. In the USA 75 MHz of spectrum within the band 5850-5925 MHz have been allocated to Dedicated Short Range Communications (DSRC) providing ITS applications with specific channels for safety and with general access priority to safety applications in all the band. In Japan 80 MHz (5770-5850 MHz) is dedicated for DSRC and intended for ITS applications including IVC and R2V communication. Other countries world wide are considering the 5.9 GHz band for road safety applications which may provide further global harmonisation of the use of this particular frequency range for ITS.

## **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 the radio spectrum related matters and for the carriage and use of equipment throughout Europe. The harmonisation on an European basis supports the *Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity*. 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 the 5875-5925 MHz frequency band for  
Intelligent Transport Systems (ITS)**

**(ECC/DEC/(08)01)**

**(2008/671/EC)**

Comparable technical specifications to those given in this ECC Decision are given in Commission Decision 2008/671/EC of 5 August 2008. EU/EFTA Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that there is an industry requirement for designation of frequency spectrum within the band 5875-5925 MHz for harmonised implementation and deployment of Intelligent Transport Systems (ITS);
- b) that the deployment of ITS in Europe would support the European Union e-Safety initiative with the goals to reduce road fatalities and improve the efficiency of road traffic and the i2010 policy of the European Union;
- c) that the frequency band 5875-5925 MHz is allocated to the Mobile Service, the Fixed Service and the Fixed-Satellite Service (Earth-to-space) on a primary basis in ITU Region 1 and in the European Common Allocation table;
- d) that ITS applications providing communication to and from mobile units are considered as an application in the Mobile Service and that frequency spectrum should be designated to ITS as to any other mobile service application based on the agreed compatibility conditions;
- e) that the CEPT/ECC studies regarding the spectrum requirements for road safety and traffic efficiency within the 5.9 GHz band based on accepted traffic scenarios with both Inter Vehicle Communication (IVC) and Roadside to Vehicle Communication (R2V) have confirmed that a realistic estimate of the needed bandwidth is between 30-50 MHz including 20 MHz of bandwidth for critical road safety applications;
- f) that ECC Report 101 on ‘Compatibility studies in 5855-5925 MHz between ITS and other systems’ provides the results of compatibility studies between the ITS and other services within the band 5875-5925 MHz as well as requirements to protect other services below 5850 MHz and above 5925 MHz;
- g) that the main conclusions of the compatibility study performed by the CEPT/ECC indicate that within the frequency band 5875-5905 MHz, ITS applications will not suffer from excessive interference resulting from other services/systems and ITS in this band is compatible with all other services providing that their unwanted emissions levels are less than -55 dBm/MHz e.i.r.p. below 5850 MHz, less than -65 dBm/MHz e.i.r.p. below 5815 MHz and less than -65 dBm/MHz e.i.r.p. above 5925 MHz;
- h) that ITS devices can not claim protection from FSS earth stations in the frequency band 5875-5925 MHz;
- i) that ITS applications may be developed and deployed in Europe based on the conditions described in the ECC Report 101 with a frequency designation of 30 MHz for road safety applications in the band 5875-5905 MHz and with the band 5905-5925 MHz to be considered for future ITS extension;
- j) that standardisation of radio equipment and communication protocols to ensure cross-border interoperability for various applications envisaged is ongoing within ETSI, which has developed EN 302 571, and other international standardisation organisations;

- k) that road safety systems in the 5.9 GHz band is based on channel access technology where only one device is active on a channel at the same point in time in a given area and all mobile as well as roadside units are operating in the same network. However, a coordination mechanism of roadside infrastructure may need to be considered to ensure that different ITS operators can coexist;
- l) that ITS critical safety applications are not seeking the status of safety of life service (RR 1.59);
- m) that the frequency band 5855-5875 MHz has been made available for ITS (non-safety applications) by ECC/REC/(08)01;
- n) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the R&TTE Directive. Conformity with the essential requirements of the R&TTE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the R&TTE Directive.

#### DECIDES

1. that the purpose of this Decision is to harmonise the use of the 5875-5925 MHz frequency band for Intelligent Transport Systems (ITS);
2. that for the purpose of this Decision, Intelligent Transport Systems (ITS) road safety applications mean those applications whose aim is to reduce the number of traffic fatalities or accidents using vehicle-to-vehicle or roadside-to-vehicle communications;
3. that CEPT administrations shall designate the frequency sub-band 5875-5905 MHz on a non-exclusive basis for ITS road safety applications;
4. that CEPT administrations shall consider within a future review of this Decision the designation of the frequency sub-band 5905-5925 MHz for an extension of ITS spectrum noting that protection of ITS can not be ensured in this band. This Decision would be subject to the regular three-year review process within the ECC which would include evidence of future market needs;
5. that the maximum spectral power density for ITS stations should be limited to 23 dBm/MHz e.i.r.p. but the total power shall not exceed 33 dBm e.i.r.p. with a Transmit Power Control (TPC) range of 30 dB;
6. that protection of existence services needs to be ensured in the ITS bands and in adjacent bands;
7. that CEPT administrations shall permit free circulation and use of ITS equipment subject to the provisions of this Decision;
8. that CEPT administrations shall exempt in-vehicle ITS equipment from individual licensing;
9. that, although ITS roadside units are designed to be self-coordinating, CEPT administrations may, if necessary, impose an authorisation process;
10. that this ECC Decision enters into force on 14 March 2008;
11. that the preferred date for implementation of this ECC Decision shall be 1 September 2008;
12. 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:

- 1 *The following Members have a derogation to implement this Decision until [xx yy zzzz].  
Austria until 1 April 2012*
- 2 *Please check the Office web site (<http://www.ero.dk>) for the up to date position on the implementation of this and other ECC Decisions.*