

Spectrum for IMT

Introduction

In the mid 1980's the ITU started work to define the next "generation" of mobile radio standards to move existing mobile networks from specific National and Regional standards onto a global basis. This necessitated finding a new globally available frequency band as well as attempting to maximize convergence within the many existing second generation mobile wireless technologies.

At the 1992 ITU World Radio Conference 230 MHz of new radio spectrum was identified for the terrestrial component of 'Future Public Land Mobile Telecommunication Systems' (FPLMTS), later to be known as International Mobile Telecommunications-2000 (**IMT-2000**). This provided the necessary impetus to complete ITU standards for the third generation of mobile radio technologies in time for initial commercial implementation of IMT-2000 (**3G**) in the year 2000.

Early work on 3G in the ITU was directed towards obtaining a global spectrum allocation since multi-band radios were at that time economically unattractive. Similarly a single global standard for 3G seemed at the time the only realistic solution. However it became rapidly clear that even the 230 MHz of new spectrum identified in 1992 would be insufficient for future mobile needs. At the ITU World Radio Conference in 2000 all the major existing cellular bands were also added, increasing the potential IMT-2000 spectrum availability by approximately three times. Fortunately it also became practical to produce economical multi-band radios.

Due to the rapid growth of 2G mobile during the 1990's it became necessary for the ITU to offer a number of possible routes from the various existing 2G systems to a 3G capability. Fortunately it also became economically realistic to offer multi-mode/multi-band mobile equipment to smooth the transition from 2G to 3G operations.

Mobile radio technologies are proving to be the only economical approach to making telecom services available to underserved regions in developing countries and globally mobile users far outstrip fixed telecom users. In developed countries mobile use is near saturation and so the driving force in these areas is new "broadband" multimedia services. These new services will be provided through enhancements to IMT-2000 (**3G**) and through IMT-Advanced (**4G**) in the future. **IMT is the generic ITU name for 3G/4G.**

Radio spectrum below 1 GHz is optimum for the needs of developing countries, due to the ability to serve larger rural areas from a single cell site compared to spectrum above 2 GHz. However, it is very challenging to find wide bandwidths below 1 GHz so "broadband" needs must be met primarily through spectrum above 2 GHz.

The 2007 World Radio Conference made valuable strides in identifying additional spectrum for **IMT**, both below 1GHz and above 2 GHz.

Identification of Spectrum for IMT in the ITU Radio Regulations

The ITU Radio Regulations are an international treaty, signed by ITU Members and updated at regular intervals in World Radio Conferences. They provide a top level view of how the radio spectrum is to be shared amongst the many global, regional and national radio-based services. Individual regional and national regulators work within this high level ITU framework to meet their own specific priorities and needs. As long as there are no potential international interference situations, regional and national plans can and do differ significantly from the ITU “master plan”.

Even though vast amounts of radio spectrum are allocated on a PRIMARY basis to the Mobile Service in the ITU Radio Regulations this spectrum is not necessarily available to IMT in any given area. There are many other competing radio-based services and spectrum is often designated co-PRIMARY for both Fixed and Mobile services.

The concept of **identifying** spectrum for *potential* use by IMT, in the ITU Radio Regulations, gives global equipment manufacturers some guidance on the range of frequency bands in which IMT services are likely to be deployed, leading to economies of scale and minimizing product costs. The **identification “for those administrations wishing to deploy IMT”** allows use by other services to which the spectrum is allocated and does not convey any priority for IMT over those other radio-based services.

The following frequency bands are currently identified for IMT in all three ITU Regions:

450 – 470 MHz
790 – 960 MHz
1710 – 2025 MHz
2110 – 2200 MHz
2300 – 2400 MHz
2500 – 2690 MHz

Note that the Radio Regulations are extremely complex with vast numbers of **Footnotes** to clarify the detailed agreements between the ITU Members so **this information is of necessity just a high level view of the global spectrum organization for IMT.**

Additional frequency bands identified for IMT on a Regional or National basis:

698-790 MHz (Region 2)

610 – 790 MHz (9 countries in Region 3: Bangladesh, China, Rep. of Korea, India, Japan, New Zealand, Papua New Guinea, Philippines and Singapore.)

3400 – 3600 MHz (Over 80 Administrations in Region 1 plus 9 in Region 3 including India, China, Japan and Rep. of Korea).