Suitable new bands for IMT at WRC-15:
A Graphic Guide



Spectrum4All

About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.

For more information, please visit the GSMA corporate website at www.gsma.com.
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Introduction

From 2008-2013 global mobile data traffic grew an astonishing 45-fold creating an urgent need for more mobile broadband spectrum. ITU Member States have agreed to tackle this serious challenge at WRC-15 under agenda item 1.1. The ITU estimates that 1340-1960 MHz will be required by 2020 and the GSMA calculates that an additional 600-800MHz needs to be made available at WRC-15.

This booklet highlights, in short form, why and how each of the GSMA's recommended frequency bands could be identified for IMT at WRC-15. The aim is to explain at a high level how the bands can be used for mobile services while also addressing the needs of existing spectrum users.

The GSMA believes the following bands have the greatest potential for global harmonisation:

Sub-700MHz UHF (470-694/698 MHz) PAGE 4 - 5

L-Band (1350-1400 & 1427-1518 MHz) PAGE 6 - 7

2.7-2.9 GHz PAGE 8 - 9

C-Band (3.4-4.2 GHz) PAGE 10 - 11

The case for an IMT identification in the sub-700MHz UHF* band at WRC-15

Mobile data traffic is growing so rapidly that new mobile broadband spectrum will be essential to prevent a network slowdown

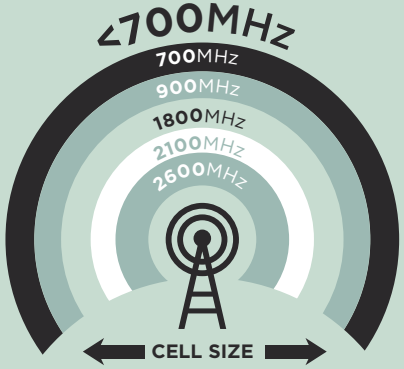
GLOBAL MOBILE DATA GREW

45x

from 2008-2013

Coverage bands – like 700MHz and 800MHz – will ultimately reach capacity putting mobile broadband at risk in emerging markets, rural areas and inside buildings

Low frequency mobile bands travel further making them essential to connect the unconnected and provide better overall quality of service

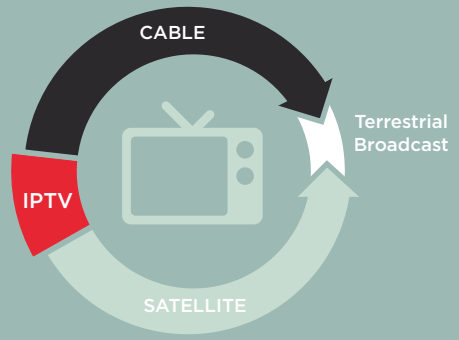


An identification is possible because the evolution of terrestrial broadcast TV delivery means more can be done with less spectrum

This is giving regulators greater flexibility regarding how they choose to use the band

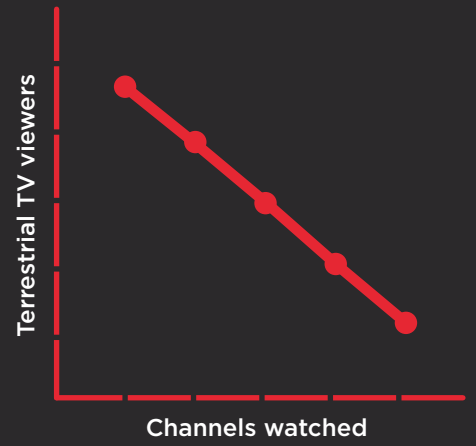
*470-694/698MHz. GSMA recommends a co-primary allocation in this band in Europe.

In some countries mobile could use a portion because few people watch terrestrial broadcast TV so services could be reduced or switched off

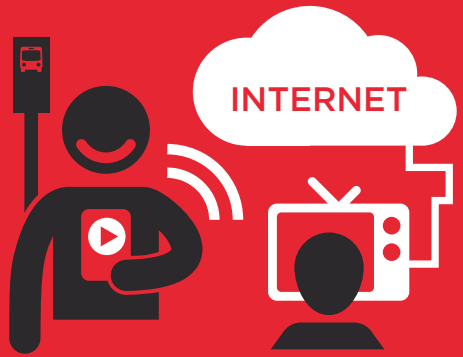


MOST POPULAR BROADCAST TV DELIVERY METHODS

In countries where terrestrial TV is heavily used, the vast majority of people only watch a limited number of TV channels which could be supported in less spectrum



There will be less demand for a huge number of broadcast channels in future as people increasingly use the internet to watch whatever, whenever and wherever



Most fixed and mobile internet traffic is already video



An identification will start the vital long-term planning needed to help countries that want the flexibility to use the band for mobile, broadcasting or a convergence of both

The case for an IMT identification in the L-band* at WRC-15

Mobile data traffic is growing so rapidly that new mobile broadband spectrum will be essential to prevent a network slowdown

GLOBAL MOBILE DATA GREW

45x

from 2008-2013

1452-1492MHz

TENANTS WANTED

A large portion has been reserved for digital audio broadcasting in many countries, and in the majority of these it remains unused creating the perfect basis for an identification

EUROPE ALREADY PLANS TO USE THIS PORTION FOR MOBILE BROADBAND

ITU sharing studies show mobile services can operate in the band without causing interference to other users if appropriate measures are taken

The characteristics of the L-band means it could provide a good mixture of mobile coverage and capacity



L-BAND WAVES ARE RELATIVELY LOW FREQUENCY SO WILL TRAVEL REASONABLY FAR AND PENETRATE BUILDINGS YET THERE IS ENOUGH BANDWIDTH TO PROVIDE GOOD DATA SPEEDS



Most of the band is already allocated to mobile on a primary basis worldwide so there is a major opportunity to quickly identify a globally harmonised IMT band

A GLOBAL MARKET MEANS LOWER COST MOBILE DEVICES WITH INTERNATIONAL ROAMING

Although an array of different services use the band, it remains under-utilised in most countries



Radar | Aeronautical telemetry | Broadcast satellite service | Fixed links

There are major economic benefits in favour of mobile

in Latin America consumer surplus would reach

US$6.6 Bn

BY 2017

WHICH IS **20x**

the cost of moving existing users



The L-band is proving to be a popular IMT target band among regulators around the world so is a good option for WRC-15

*1350-1400MHz & 1427-1518MHz

The case for an IMT identification in the 2.7-2.9GHz band at WRC-15

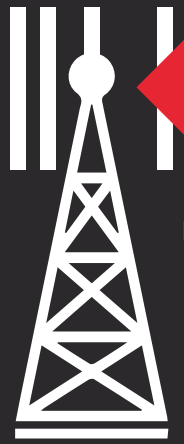


Mobile data traffic is growing so rapidly that new mobile broadband spectrum will be essential to prevent a network slowdown

Global Mobile Data Grew **45x** from 2008-2013



All existing radar requirements can be met in the band while still leaving a portion available for future mobile broadband use



It could use the same cell sites as the 2.6GHz band making deployments relatively quick and low cost

ITU studies show the right mitigation techniques enable sharing between radars and mobile without creating interference concerns or making deployments impractical





The band is significantly under-utilised in most countries. Where it is used, it mainly serves radars at airports leaving it unoccupied in other areas

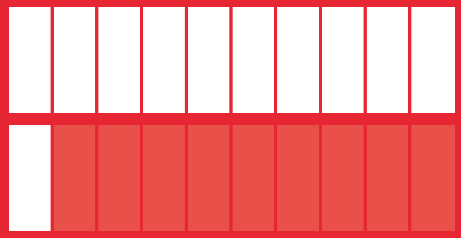
MOST COUNTRIES HAVE VERY FEW RADARS AND SOME HAVE NONE AT ALL

There are also some meteorological radars in the band in some countries



Most of the radars are aging and spectrum inefficient so can waste valuable spectrum that could also deliver mobile broadband

There are major economic benefits in favour of mobile – in Western Europe the benefits are 10x greater than the cost of relocating radars





Regulators can support radar use, expand mobile broadband and benefit their economies by supporting IMT in 2.7-2.9GHz

The case for an IMT identification in the C-band at WRC-15

Mobile data traffic is growing so rapidly that new mobile broadband spectrum will be essential to prevent a network slowdown

GLOBAL MOBILE DATA GREW

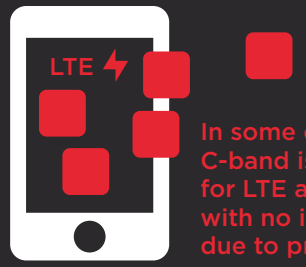
45x

from 2008-2013

Regulators won't license any C-band spectrum to mobile operators until data demands increase further so satellite incumbents won't be moved unnecessarily



In urban areas in developed markets, where mobile data is growing fastest and satellite C-band use is lower, LTE services could quickly operate in part of the band

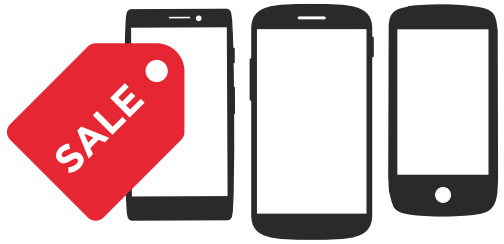


In some countries the C-band is already used for LTE and satellite with no interference due to proper planning

The size of the C-band means a portion could be used to provide ultra-fast mobile broadband services while leaving satellite services to operate in the remainder



LARGE, CONTIGUOUS BANDWIDTH IS AVAILABLE IN THE C-BAND ENABLING MASSIVE ADDITIONAL MOBILE DATA CAPACITY



Tropical countries may not choose to use the C-band for mobile until later but by supporting it at WRC-15 they will benefit from low cost devices when they are ready

Mass production in the medium term will result in **low-cost devices** in the long-term

This will be possible because satellite services will need less C-band spectrum in future as they take advantage of better performing higher frequency bands

Satellite providers are increasingly using higher frequency Ka & Ku bands which can provide better quality and lower cost services even in tropical areas proving rain fade is not always insurmountable



Major economic benefits will be lost without an IMT identification in the C-band.

In Asia Pacific alone

100k

NEW JOBS

$53B

IN GOVERNMENT REVENUES



Governments can keep their options open and safeguard the future of mobile and satellite services by supporting a C-band IMT identification at WRC-15



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