



The WRC series  
Considerations for the 3.5 GHz IMT  
range: getting ready for use

May 2017

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# Introduction

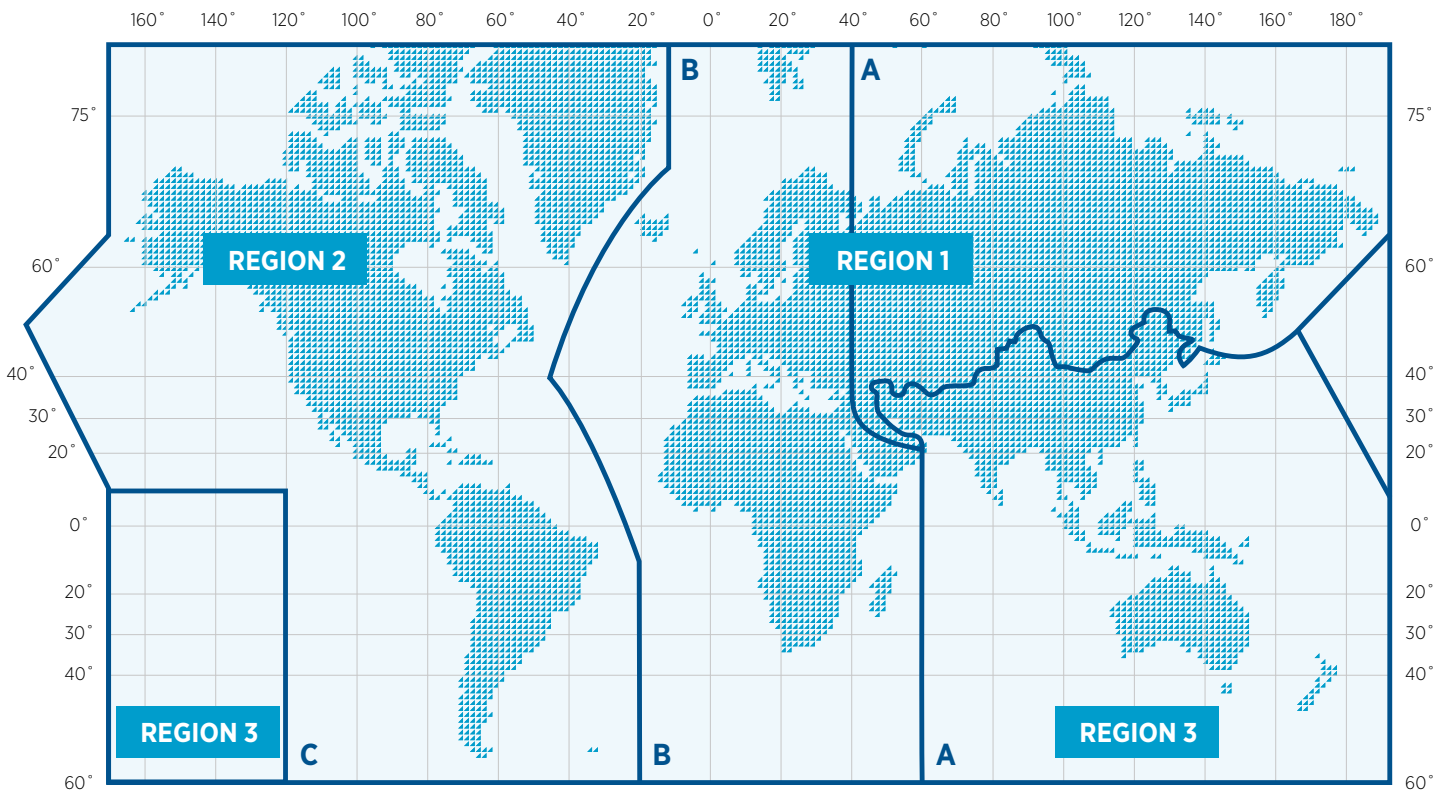
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For operators to be able to keep up with growing data and coverage demands new spectrum for mobile broadband is needed. The 3.5 GHz IMT range between 3.3 GHz and 3.8 GHz offers an ideal opportunity to meet this demand. The band will be one of the first frequencies to carry 5G traffic, making it a critically important band for mobile operators seeking to offer the power of next generation mobile services to consumers and businesses. And in the process, give their respective national economies a boost.

After the identification of part of the range at WRC-07, a much broader identification was achieved at WRC-15 with a harmonised International Mobile Telecommunication (IMT) identification for 3.4-3.6 GHz throughout Regions 1 and 2 and in many countries in Region 3.

In addition to this, large parts of Africa along with some countries in Latin America and Asia Pacific added the 3.3-3.4 GHz band to the range and some countries in Region 2 added 3.6-3.7 GHz to their IMT identifications at WRC-15. European Union countries have decided to also use 3.6-3.8 GHz for mobile broadband services. A number of major Region 3 countries have announced their intention to also make available the 3.6-3.7 GHz band for IMT, as part of their allocation to the mobile service.



## Where is your 3.5 GHz IMT range?

<b>3.3-3.4 GHz</b>	A majority of Africa, some countries in Regions 2 and 3
<b>3.4-3.6 GHz</b>	Region 1, Region 2 and large parts of Region 3
<b>3.6-3.7 GHz</b>	Some countries in Region 2. Some countries in Region 3 (including Australia, Korea, Japan, New Zealand) have also indicated interest.
<b>3.6-3.8 GHz</b>	Harmonised for mobile broadband use throughout the European Union by European Decision. GCC countries have also indicated interest.

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## 3.5 GHz IMT tuning range: the case for TDD technology

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The 3.5 GHz range is not in its entirety identified for IMT. But it still benefits from harmonisation of equipment if TDD band plans are universally adopted. With the use of TDD technology, a single device will be able to operate in the entire range (3.3-3.8 GHz) and adjust to portions of the band released in any given country.

That enables not only regional flexibility, but seamless roaming and the economies of scale necessary to drive down the cost of equipment. All this makes for an excellent match. In contrast, the use FDD would result

in much more complicated band plans. That would in turn close the door for the advantages offered by TDD. Global TDD standards and equipment already exists to support operation in the 3.4-3.8 GHz range. Equipment that supports a broader range expected soon. Therefore, countries will soon benefit from the adoption of a TDD band plan.

**A TDD band plan provides flexibility so countries can examine the C-band band and pick the parts of that best fits their situation and meets their national needs.**

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## A core 5G band

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The 3.5 GHz IMT range is already emerging as a core band for 5G. It has the technical characteristics that will make it useful in delivering higher-speed services. As described in the GSMA's 5G spectrum position paper, this next generation needs spectrum in three key frequency ranges to deliver widespread coverage and support all use cases, Sub-1 GHz, 1-6 GHz and above 6 GHz.

The 3.5 GHz IMT range is an important addition to the middle group, offering a mix of capacity (the

amount of traffic it can support) and coverage (the distance the signals travel). It is especially useful for 5G deployment because the band has the potential to provide a large amount of contiguous spectrum that will support channels with wide bandwidth, ideal for 5G deployment.

The band has been an early focus of 5G development by equipment manufacturers and some of the initial deployments of 5G in many countries are expected to use it.

# Coexistence with existing services guaranteed

As part of the ITU process, IMT use of the C-band has already been the subject of significant deliberations. There are ITU-agreed measures designed to ensure coexistence with existing services in country and with neighbouring countries. These measures can give confidence to countries that existing services can continue to operate.

## **Coexistence with FSS:**

### **Adjacent band**

Adjacent band compatibility between IMT and the fixed-satellite service (FSS) is a national issue and each Administration must decide how best to address it in their country. It has been thoroughly studied by the ITU and administrations can make use of their studies when deciding the appropriate sharing criteria to adopt in terms of what guard band and power limitations, among other options. The ITU studies can be found in Report ITU-R S.2368.

IMT and FSS may meet at different parts of the range, be it 3.4 GHz, 3.6 GHz, 3.7 GHz or 3.8 GHz, depending on regional and national identifications as well as national regulations.

## **Cross-border issues**

Administrations wishing to implement IMT in the 3.4-3.7 GHz range must comply with the limits set out in the ITU Radio Regulations unless otherwise agreed by the neighbouring administration. This approach is designed to facilitate cross-border coordination and protect services from interference.

The relevant Radio Regulations are footnotes 5.430A, 5.431B, 5.432A, 5.432B, 5.433A and 5.434.

## **Coexistence with radiolocation services:**

Radiolocation services (e.g. radar) operating in the 3.3-3.4 GHz portion of the band are protected by the ITU Radio Regulations. Administrations wishing to implement IMT in 3.3-3.4 GHz must comply with limits and provisions set in footnotes 5.429B, 5.429D and 5.429F.



## Next steps

The C-band is going to be an increasingly important band for mobile broadband use in the coming years. To prepare for making this spectrum available to support mobile broadband needs, administrations should:

- Engage with stakeholders to determine the parts of the band to make available for mobile broadband and the timetable for assigning it
- Put in place parameters for coexistence with existing services to ensure the mobile broadband ecosystem can grow in your country
- Use the relevant part of the 3.3-3.8 GHz band for mobile broadband as soon as practical

## Further reading

The GSMA has produced policy position and reports that are relevant to this topic:

5G spectrum policy position

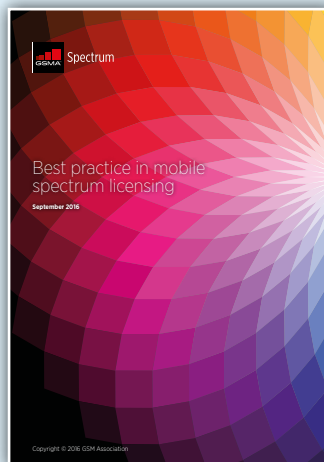
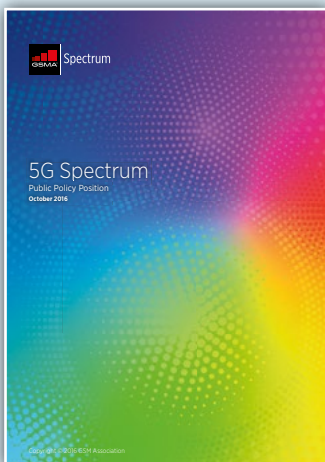
[www.gsma.com/spectrum/5g-spectrum-policy-position/](http://www.gsma.com/spectrum/5g-spectrum-policy-position/)

Best practice in mobile spectrum licensing

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