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SPECTRUM ASPECTS

## GSM Association

### SUGGESTIONS FOR “SUITABLE FREQUENCY RANGES” TO BE SUBMITTED BY WP 5D TO JTG 4-5-6-7

#### 1 Introduction

At WRC-12 a new Agenda item for WRC-15 was agreed on IMT, namely:

*“1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for IMT and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC 12);”*

At CPM15-1 it was decided that a Joint Task Group (JTG 4-5-6-7) was to be responsible for WRC-15 Agenda item 1.1 (as well as 1.2). The terms of reference of that JTG call for WP 5D to provide:

*“studies from Working Party 5D on the spectrum requirements for the mobile service, **including suitable frequency ranges**<sup>1</sup>, and other specific requirements as well as results of studies from any concerned Working Parties on technical and operational characteristics, spectrum requirements and performance objectives or protection requirements of other services;”*

The GSMA would like to suggest the list of bands below for consideration, to form part of such a submission to the JTG (on suitable frequency ranges). GSMA believes that making such potential candidates known as early as possible will assist the JTG in its challenging task of completing the necessary sharing studies in time for the CPM text; which the GSMA understands will be required by Q3 2014.

The list of suitable frequency ranges provided by GSMA is not meant to be exclusive or exhaustive, but is an initial view reached by GSMA and its members for consideration under this Agenda item.

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<sup>1</sup> Emphasis added by GSMA.

## 2 Discussion

The GSMA believes that the work done by WP 5D and others in assisting the JTG, in its task of responsibility for Agenda items 1.1 and 1.2, will have a major bearing on the ability of the JTG to complete its work in an efficient and timely manner. To that end the GSMA and its industry members and associate members stand ready to offer whatever assistance we can to facilitate this process.

In coming to the view on the proposed list of bands that should be considered, the GSMA has taken a number of factors into account. One factor is to identify bands that can help promote the wider availability of mobile broadband via IMT to consumers globally. A major enabler for this will be driving down device costs via global or regional economies of scale – which will be of significant importance not only in developing markets. Such economies of scale have enabled WCDMA/HSPA to pass the one billion connections mark globally. This was facilitated through widely available IMT capacity bands such as 2 GHz and 2.6 GHz in conjunction with coverage bands such as below 1 GHz.

To facilitate the availability of low cost devices requires that bands not only be suitable for coverage or capacity, but also have the possibility to be adopted in a large number of markets; but recognising that market conditions will vary from country to country and that will affect the timeline for adoption.

It is also important to recognise that new technologies such as IMT-Advanced work better with wider channel bandwidths, and that many countries will want to ensure spectrum for multiple operators. It must also be borne in mind that the number of bands that can be accommodated in a device are limited. To make it economically viable to include extra RF bands, consideration must be given to the extra utility added. This might suggest new IMT bands should be around 100 MHz (or more if possible). An exception to this might be where new bands are adjacent to existing IMT identifications, or help use existing IMT spectrum more efficiently.

Most of the bands proposed were examined in the run-up to WRC-07 (see for example Report ITU-R M.2079). However some of the assumptions used then may need to be revisited, and technology changes and improvements may need to be accounted for as well. There may also be changes from Administrations in their views on the ability to migrate existing services from some bands, as well as the relative importance of IMT.

The list of suitable frequency ranges proposed does not include spectrum above 5 GHz. This does not exclude the potential usefulness of such bands, but the current view of the GSMA is that bands above 5 GHz are likely to prove most suitable for enhanced local access services. Especially when large bandwidth carriers (100 MHz), and dense MIMO arrays, are required to meet high spectrum efficiencies (of more than 10 bps/Hz).

Bands below 5 GHz are likely to be most useful for the wide-area mobile services that are currently used for some six billion connections globally. It is such commercial services that will be the main mechanism for delivering broadband globally.

Bands below 450 MHz may be difficult to use because of the impact on terminal size to ensure efficient antennas.

### **3 Proposal**

The GSMA believes that the list of suitable frequency ranges for consideration by WRC-15 (under Agenda item 1.1) should be:

- 1) 470-790 MHz;
- 2) 1 300-1 700 MHz;
- 3) 2 090-2 110 and 2 200-2 215 MHz;
- 4) 2.7-2.9 GHz;
- 5) 3.4-3.6 GHz;
- 6) 3.6-3.8 GHz; and
- 7) 3.8-4.2 GHz.

