

**RADIO SPECTRUM AND TECHNICAL STANDARDS  
ADVISORY COMMITTEE**

**Overview of Spectrum Allocation for Fixed Links in Hong Kong**

**Purpose**

This paper updates members on spectrum allocations for fixed links<sup>1</sup> in Hong Kong.

**Background**

2. At present, the major frequency bands commonly used by fixed links in Hong Kong lie in the range of 6 – 38 GHz. These fixed links are used by Government and non-Government users, including mobile network operators, public utilities, public safety agencies and broadcasters. Table 1 below lists out the frequency bands available to fixed links in Hong Kong, maximum channel bandwidth, number of channels available and current channel occupancy. With evolving technologies and services, there are some changes in the allocation of spectrum for fixed links in the recent years.

<b>Frequency Band<sup>2</sup></b>	<b>Maximum Channel Bandwidth</b>	<b>Number of Channels Available</b>	<b>Channel Occupancy in Percentage</b>
6400 – 7100 MHz	40 MHz	16	100%
7420 – 7750 MHz	14 MHz	40	100%
8275 – 8500 MHz	28 MHz	12	100%
10150 – 10300 MHz	3.5 MHz	42	10%

<sup>1</sup> According to Article 1.20 of the Radio Regulations, fixed service is defined as : A radiocommunication service between specified fixed points.

<sup>2</sup> Please refer to Annex II of the Hong Kong Table of Frequency Allocations for details:  
[https://www.ofca.gov.hk/filemanager/ofca/common/Industry/broadcasting/hk\\_freq\\_table\\_en.pdf](https://www.ofca.gov.hk/filemanager/ofca/common/Industry/broadcasting/hk_freq_table_en.pdf)

10500 – 10680 MHz	3.5 MHz	50	8%
10700 – 11700 MHz	40 MHz	24	75%
12750 – 13250 MHz	28 MHz	16	60%
14400 – 15350 MHz	28 MHz	32	54%
17700 – 19700 MHz	27.5 MHz	30	31%
21200 – 23600 MHz	28 MHz	60	56%
37000 – 39500 MHz	112 MHz	20	34%

**Table 1**

3. In 2012, the then Radio Spectrum and Technical Standards Advisory Committee (“SSAC”) reviewed the general characteristics of typical fixed links in various frequency bands, including the practicable maximum path length and transmission data rate<sup>3</sup>. In general, the lower the operating frequency, the longer the path length could be. On the other hand, data rate depends on channel bandwidth where wide-bandwidth channels are only available in higher frequency bands. For instance, a fixed link operating in the 37 – 39.5 GHz band can provide 112 MHz channel bandwidth, and it can support a typical path length of some 2 km and a data rate of some 2 Gbps. On the other hand, a 3.5 MHz bandwidth fixed link operating in the 10.15 – 10.3 GHz and 10.5 – 10.68 GHz bands can support a typical path length of some 16 km and a data rate of some 35 Mbps. The then SSAC also reviewed the effect of different modulation and polarisation schemes on the maximum path length practically achievable<sup>4</sup>. Against this background, the Office of the Communications Authority (“OFCA”) used to assign frequencies at low frequency bands for long haul links, and high frequency bands for short haul links.

## **Recent Development Concerning Spectrum Allocation for Fixed Service**

### Allocation of the 26/28 GHz Bands to Mobile Service

4. Before 2019, the 26 GHz (24.25 – 27.5 GHz) and 28 GHz (27.5 –

<sup>3</sup> Please refer to the SSAC Paper 3/2012 which is available at [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_751/SSAC\\_Paper\\_3\\_2012.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_3_2012.pdf)

<sup>4</sup> Please refer to the SSAC Paper 7/2012 which is available at : [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_751/SSAC\\_Paper\\_7\\_2012.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_7_2012.pdf)

28.35 GHz) bands (collectively referred to as the “26/28 GHz bands”) were allocated primarily to fixed service in Hong Kong. As a result of the joint decision<sup>5</sup> of the Communications Authority (“CA”) and the Secretary for Commerce and Economic Development promulgated on 13 December 2018, a co-primary allocation for mobile service was added to the 26/28 GHz bands with effect from 1 January 2019 for re-assignment to the fifth generation mobile (“5G”) services. The affected fixed links were relocated to other suitable frequency bands in accordance with the general approach as mentioned in para. 3 above. Since 2019, an administrative approach has been adopted for assigning the relevant spectrum to eligible operators to provide 5G services<sup>6</sup> and innovative localised wireless services.

### Potential Allocation of the 6425 – 7125 MHz Band to Mobile Service

5. The International Telecommunication Union will deliberate the use of the 6425 – 7125 MHz band for International Mobile Telecommunications (“IMT”) in the World Radiocommunication Conference (“WRC”) to be held in 2023 (“WRC-23”)<sup>7</sup>. In Hong Kong, this band is currently shared use by fixed links, outside broadcasting links, satellite uplinks and ultra-wideband devices. As mentioned in the public consultation paper for the creation of a new class licence for 6 GHz devices<sup>8</sup> issued on 26 November 2021, the CA will consider the use of the aforesaid band, or parts thereof, for 5G services in Hong Kong subject to the outcome of WRC-23 and other considerations including co-existence with the incumbent services and frequency coordination with the neighbouring regions sometime around 2023.

### Allocation of the 37 – 43.5 GHz Band to Mobile Service

6. The WRC held in 2019 identified the 37 – 43.5 GHz band for 5G services globally. OFCA consulted SSAC<sup>9</sup> in 2020 and sought the CA’s approval to add a co-primary allocation for mobile service to this band. The vacant 39.5 – 43.5 GHz band was added to the Spectrum Release Plan for

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<sup>5</sup> [https://www.coms-auth.hk/filemanager/statement/en/upload/480/joint\\_statement\\_st\\_052018.pdf](https://www.coms-auth.hk/filemanager/statement/en/upload/480/joint_statement_st_052018.pdf)

<sup>6</sup> [https://www.ofca.gov.hk/en/news\\_info/press\\_releases/index\\_id\\_1891.html](https://www.ofca.gov.hk/en/news_info/press_releases/index_id_1891.html)

<sup>7</sup> The WRC held in 2019 approved a new agenda item for WRC-23 concerning the proposed identification of the 6.425-7.025 GHz and 7.025-7.125 GHz bands for IMT services in Region 1 and globally respectively.

<sup>8</sup> [https://www.coms-auth.hk/filemanager/en/content\\_711/cp20211126\\_e.pdf](https://www.coms-auth.hk/filemanager/en/content_711/cp20211126_e.pdf)

<sup>9</sup> SSAC Paper 2/2020 which is available at [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_751/SSAC\\_Paper\\_2\\_2020.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_2_2020.pdf)

2021 – 2023<sup>10</sup> to inform the industry of the potential supply of this band for provision of public mobile services subject to technology and market developments. The remaining 37 – 39.5 GHz band is currently being used by fixed links, but might also be considered for use of public mobile services if there are market demand and suitable bands to relocate the concerned existing links.

### Potential Use of the 80 GHz Band for Fixed Service

7. In 2014, the then SSAC explored the possible use of the 71 – 76 GHz and 81 – 86 GHz bands (collectively referred to as the “80 GHz band”) for high throughput and high capacity fixed links<sup>11</sup> in Hong Kong. Such fixed links could support a maximum channel bandwidth of 5 GHz with a maximum data rate of multiple gigabits per second<sup>12</sup>. OFCA had facilitated some interested parties to conduct trials in the 80 GHz band and the test results<sup>13</sup> are published at OFCA’s website for general reference. There was no further development afterwards.

### **Relevant Issues**

8. As part of the licence fees, pursuant to the Telecommunications (Carrier Licences) Regulation (Cap. 106V)<sup>14</sup>, the use of spectrum for fixed links by holders of carrier licences is subject to a fee for the management of radio frequencies assigned to them, viz. spectrum management fee, excluding those frequency bands<sup>15</sup> stipulated in Schedule 3 to Cap. 106V.

9. Pursuant to the Telecommunications (Level of Spectrum Utilization Fee) (Fixed and Other Links) Regulation (Cap. 106AE)<sup>16</sup> which entered into

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<sup>10</sup> [https://www.ofca.gov.hk/filemanager/ofca/common/Industry/broadcasting/spectrum\\_plan2021\\_en.pdf](https://www.ofca.gov.hk/filemanager/ofca/common/Industry/broadcasting/spectrum_plan2021_en.pdf)

<sup>11</sup> Please see SSAC Paper 3/2014 which is available at [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_751/SSAC\\_Paper\\_3\\_2014.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_3_2014.pdf)

<sup>12</sup> Please see Section 3.1 in ITU-R F.2323-1: Fixed service use and future trends, which is available at [https://www.itu.int/dms\\_pub/itu-r/opb/rep/R-REP-F.2323-1-2017-PDF-E.pdf](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-F.2323-1-2017-PDF-E.pdf)

<sup>13</sup> [https://www.ofca.gov.hk/en/industry\\_focus/pub\\_report/technical\\_reports/index.html#02](https://www.ofca.gov.hk/en/industry_focus/pub_report/technical_reports/index.html#02)

<sup>14</sup> [https://www.elegislation.gov.hk/hk/cap106V!en?INDEX\\_CS=N](https://www.elegislation.gov.hk/hk/cap106V!en?INDEX_CS=N)

<sup>15</sup> Including the 6.765 – 6.795 MHz, 13.553 – 13.567 MHz, 26.957 – 27.283 MHz, 40.66 – 40.7 MHz, 2400 – 2500 MHz, 5.725 – 5.875 GHz, 24.0 – 24.25 GHz, 61 – 61.5 GHz, 122 – 123 GHz and 244 – 246 GHz bands.

<sup>16</sup> [https://www.elegislation.gov.hk/hk/cap106AE!en?INDEX\\_CS=N](https://www.elegislation.gov.hk/hk/cap106AE!en?INDEX_CS=N)

force in 2018, a number of congested frequency bands as assigned administratively for use of fixed links is subject to the payment of spectrum utilization fee. These included six bands in the 2055 – 2095 MHz, 5875 – 6425 MHz, 6425 – 7100 MHz, 7421 – 7900 MHz, 8275 – 8500 MHz and 10700 – 11700 MHz bands. The arrangement will be reviewed in five years after Cap. 106AE entered into force, i.e. 2023.

**Office of the Communications Authority  
December 2021**