Use of the 5 GHz Shared Band for the Provision of Public Mobile Services

Response to Consultation Paper

8 March 2018
INTRODUCTION

1. Hong Kong Telecommunications (HKT) Limited (“HKT”) welcomes the opportunity to provide its comments on the issues and proposals raised in the Consultation Paper published by OFCA on 1 February 2018 concerning Use of the 5 GHz Shared Band for the Provision of Public Mobile Services (“Consultation Paper”).

2. The spectrum band in question ranges from 5150 MHz to 5350 MHz and then from 5470 MHz to 5850 MHz (“Spectrum Band”), representing a total of 580 MHz of spectrum to be used by mobile services on a shared basis. This is a significant amount of spectrum considering that, at present, according to OFCA records, only a total of 552 MHz of licensed spectrum has been assigned to mobile operators.

3. At the outset, HKT supports the release of more spectrum for mobile services given the increasing amounts of spectrum needed to satisfy customer demand, which is driven by a continual expansion of the customer base, the thriving development of a wide range of mobile services and applications, and the pressure to provide faster access to these services and applications as noted in the Consultation Paper.

4. In the following section, HKT has extracted the specific proposals from the Consultation Paper and provides its comments for the Communication Authority’s (“CA’s”) consideration.

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1 The Spectrum Band is currently being used for public WiFi services.
THE PROPOSED REGULATORY AND LICENSING REGIME

Licence requirements

“the use of the 5 GHz Shared Band for the provision of public mobile services in Hong Kong shall be licensed and regulated in the same way as public mobile services provided by licensed radio spectrum under the existing regime of the UCL. Licensees shall observe all the rights and obligations under the relevant provisions of the TO and the UCL, and be subject to the same licence fee requirements stipulated under the Telecommunications (Carrier Licences) Regulation (Cap. 106V) irrespective of whether the mobile networks and services are using shared spectrum in the 5 GHz frequency band or licensed spectrum in other frequency bands” [paragraph 14(a)]

5. Firstly, HKT concurs that only carrier licensees holding a Unified Carrier Licence (“UCL”) who are permitted to offer mobile services should be allowed to use the Spectrum Band. This is consistent with the CA’s proposal that, initially, only Licensed Assisted Access (“LAA”) technology will be permitted to be used with the Spectrum Band, since LAA requires the use of a 4G LTE carrier in the licensed mobile spectrum as the primary carrier for control and signaling, i.e. LAA can only be used by UCL holders who have been assigned 4G spectrum.

6. Secondly, HKT recognizes that, from the customer’s perspective, since the mobile services to be provided using the Spectrum Band will be no different to the mobile services provided by the mobile operator using its licensed spectrum, it would make sense for use of the Spectrum Band to be licensed and regulated in the same way as public mobile services provided by license radio spectrum under the existing regime of the UCL.

7. However, given that the Spectrum Band is to be used on a shared, non-exclusive basis, similar to the way in which the spectrum is currently being used to provide public WiFi services, it would not be fair to treat the Spectrum Band on an equal basis with licensed spectrum which has been assigned to the mobile operator for exclusive use and hence is free of interference.
8. HKT would suggest that the same financial concessions applicable to providers of public WiFi services making use of the Spectrum Band be applied to mobile operators using the same band, in order to reflect parity in treatment. For example, neither licence fees (spectrum management fees) nor Spectrum Utilisation Fees should be charged.

9. In addition, should there be mobile base stations which are solely being installed to provide mobile service using LAA, the normal base station application procedures should be waived, similar to the manner in which femtocells are currently dealt with in the UCL, i.e. the installation of a femtocell is deemed to be approved under General Condition 12.1 of the UCL (Requirements of Radiocommunications Installation)². Any corresponding licence fee (base station fee) should also be waived.

**Eligible applicants**

“only UCL licensees assigned with licensed mobile spectrum may apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services.” [paragraph 14(b)]

10. Given the CA’s proposal that, initially, only LAA technology will be permitted to be used with the Spectrum Band (which requires the use of a 4G LTE carrier in the licensed mobile spectrum), it would make sense that only existing UCL holders who already have 4G spectrum assigned to them may apply for use of the Spectrum Band.

**Technical criteria**

11. At present, the Spectrum Band is permitted to be used by telecommunications apparatus for private use purposes without any need for licensing if the apparatus complies with the requirements stipulated under the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (“Exemption Order”) as follows:

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² If possible, the permitted emission power level should also be extended to 200mW.
### Frequency Range | Output Level | Spurious Emission
--- | --- | ---
5150 – 5350 MHz | equivalent isotropically radiated power ("e.i.r.p.") not to exceed 200 mW using only digital modulation | effective radiated power ("e.r.p.") not to exceed 10 µW
5470 – 5725 MHz | e.i.r.p not to exceed 1 W | 
5725 – 5850 MHz | (a) peak e.i.r.p. not to exceed 4 W for frequency hopping spread spectrum modulation or digital modulation systems; or (b) aggregate e.r.p. not to exceed 100 mW for any modulation | e.r.p. not to exceed 10 µW for frequency outside the frequency band in which the fundamental frequencies are located

“All relevant base stations, handsets and other radiocommunications installations operating in the 5 GHz Shared Band shall comply with the same set of technical criteria as stipulated in the Exemption Order. Subject to the CA’s approval, Schedule 3 to their UCLs will be suitably amended to incorporate the assignment of the 5 GHz Shared Band and to prescribe the associated technical requirements” [paragraph 14(b)]

12. HKT sees no reason to object to the adoption of the same set of technical criteria as stipulated in the Exemption Order should the Spectrum Band be used for mobile services.

**Permitted technology**

“given the need to ensure compatibility and effective sharing with other uses and users in the 5 GHz Shared Band, the CA will initially only allow the use of LAA technology with mandatory implementation of the LBT feature. This specific requirement, along with other technical criteria for the operation of public mobile services in the 5 GHz Shared Band, will be set out in the relevant specification(s) to be issued by the CA” [paragraph 14(c)]

13. LAA is supported by many overseas jurisdictions and operators around the world, and appears to be the most popular technology to be adopted for the Spectrum Band. As stated in the Consultation Paper, a
technical trial on the use of the Spectrum Band using LAA has already successfully been completed in Hong Kong, while another trial is also under way.

14. On this basis, HKT supports the use of LAA technology in the initial period. In order to be consistent with the CA’s technology-neutral policy, however, HKT would suggest that other technologies be permitted to be adopted as they become more developed.

Protection from interference

“a new special condition under the UCL will be prescribed to make clear that the use of the 5 GHz Shared Band is shared with other uses and users in an uncoordinated manner and will not be protected from interference caused by other radio equipment operating in the same frequency band.” [paragraph 14(d)]

15. Given that the Spectrum Band is to be used on a shared basis, HKT accepts that it will not be afforded any protection from interference by other services which have been designated as primary services in the same band. However, users of secondary services operating in the same band should be prohibited from causing interference to mobile service stations in the Spectrum Band and cannot claim protection from any interference from such mobile service stations.

Adoption of other technologies

“At the time when other technologies not requiring the use of licensed anchor (e.g. MulteFire) become widely recognised and standardised internationally, any interested parties other than MNOs may apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services. The CA will duly consider such application(s) and may give approval on a case by case basis if the applicant(s) can demonstrate to the satisfaction of the CA that –

(a) there are widely recognised international standards adopted for these technologies;
(b) there are network and customer equipment supporting these technologies available in the market;

(c) there is proof of effective compatibility with different devices and apparatus sharing the spectrum in the same frequency band; and

(d) the applicant has the capability of providing an efficient and continuous service throughout the validity period of the UCL.”

[paragraph 15]

16. While HKT supports a technology-neutral approach to spectrum assignment, it concurs that technologies other than LAA should not be permissible until they have been standardized and proven to work. Only if the technology satisfies the criteria (a) to (d) listed above should OFCA permit the mobile operator make use of the technology in Hong Kong.
PROPOSED AMENDMENT TO THE HONG KONG TABLE OF FREQUENCY ALLOCATIONS

17. The current frequency allocation and utilization in Hong Kong for the Spectrum Band is as set out in the following table:

<table>
<thead>
<tr>
<th>Frequency Range (Bandwidth)</th>
<th>Hong Kong Allocation</th>
<th>Band Plan and Existing Utilisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5150 – 5250 MHz (100 MHz)</td>
<td>• AERONAUTICAL RADIONAVIGATION • MOBILE except aeronautical mobile</td>
<td>(a) Telecommunications Apparatus</td>
</tr>
<tr>
<td>5250 – 5350 MHz (100 MHz)</td>
<td>• RADIOLOCATION • MOBILE except aeronautical mobile</td>
<td>(a) Telecommunications Apparatus</td>
</tr>
<tr>
<td>5470 – 5725 MHz (255 MHz)</td>
<td>• RADIOLOCATION • MOBILE except aeronautical mobile</td>
<td>(a) Radiolocation (b) Amateur-satellite (c) Telecommunications Apparatus</td>
</tr>
<tr>
<td>5725 – 5850 MHz (125 MHz)</td>
<td>• INDUSTRIAL, SCIENTIFIC AND MEDICAL (ISM) • Amateur</td>
<td>(a) ISM Equipment (b) Amateur (c) Telecommunications Apparatus</td>
</tr>
</tbody>
</table>

Total = 580 MHz

18. As can be seen from the table, the 5725 – 5850 MHz band is the only band within the spectrum range in question which is not currently allocated for mobile use. This means that, should this band be used for mobile services, the service provider has no choice but to accept potential interference which may be caused by the existing users of the spectrum, i.e. ISM applications.

Change of Hong Kong allocation for 5725 – 5850 MHz

“To allow the use of the 5725 – 5850 MHz sub-band for the provision of mobile services, the CA proposes, pursuant to section 32H of the TO, to allocate the sub-band to mobile service on a primary basis. The proposed allocation is in line with the ITU frequency allocation for the specific utilisation in Mainland China. For reference, the Mainland has allocated that band to mobile service on a primary basis.” [paragraph 16]
19. HKT concurs with the CA’s proposal to allocate the 5725 – 5850 MHz band to mobile services on a primary basis, which is consistent with the designation in the other bands within the Spectrum Band and also in line with the treatment of this frequency band in Mainland China. This would then result in the entire 580 MHz of the Spectrum Band being prioritized for mobile service use, and should reduce the potential level of interference from any secondary services sharing the same band.

**Condition for use of the frequency band**

“[...] the condition for use of the frequency band by mobile services should follow that of existing Wi-Fi services, i.e. on an uncoordinated and unprotected basis. To ensure compatibility of LAA with the existing amateur service, the requirements for the emission limits for LAA should follow those of existing Wi-Fi services.” [paragraph 17]

20. HKT does not object to the adoption of the same conditions for use of the Spectrum Band by WiFi services and considers the permissible emission limits acceptable.

Submitted by
Hong Kong Telecommunications (HKT) Limited
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