

Telecommunications Regulatory Affairs Advisory Committee

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

PURPOSE

This paper briefs Members on the development and use of technologies enabling the use of the shared spectrum in the 5 GHz band for the provision of public mobile services as well as the major proposals given in the consultation paper entitled “Use of the 5 GHz Shared Band for the Provision of Public Mobile Services” issued by the Communications Authority (“CA”) on 1 February 2018 (“Consultation Paper”)¹.

BACKGROUND

2. The 5 GHz Shared Band is currently utilised by apparatus and devices that operate in an unprotected and uncoordinated manner, including Wi-Fi enabled equipment widely used by the general public. Recent technology and market development in the global telecommunications industry enables the use of this shared band for the provision of fourth generation mobile services based on the Long Term Evolution standard. New technologies such as Licensed Assisted Access (“LAA”), LTE-Unlicensed (“LTE-U”), LTE Wi-Fi Aggregation and MulteFire are being developed.

3. At present, the 5 GHz Shared Band comprises four sub-bands of frequencies in 5150 – 5250 MHz (with a bandwidth of 100 MHz), 5250 – 5350 MHz (with a bandwidth of 100 MHz), 5470 – 5725 MHz (with a bandwidth of 255 MHz) and 5725 – 5850 MHz (with a bandwidth of 125 MHz), amounting to a total bandwidth of 580 MHz. If the 5 GHz Shared Band can be deployed for the provision of public mobile services in Hong

¹ The Consultation Paper has been published on the CA’s website at <https://www.coms-auth.hk>.

Kong, it will be a significant addition to the existing amount of 552 MHz of licensed mobile spectrum in various frequency bands currently assigned to mobile network operators (“MNOs”) and hence enhancement in service quality to mobile service users.

DEVELOPMENT AND USE OF TECHNOLOGIES

4. Among the available technologies for the provision of public mobile services using the 5 GHz Shared Band, the development of LAA is supported by a large number of overseas jurisdictions and operators in the world and seems to be more popular. LAA is a technical standard developed by the 3rd Generation Partnership Project (“3GPP”) with the mandatory implementation of the Listen Before Talk (“LBT”) feature to ensure compatibility and effective sharing of the 5 GHz Shared Band with other apparatus operating in the same band. The European Telecommunications Standards Institute (“ETSI”), an international telecommunications standardisation body, will incorporate the LAA technology into its suite of technical specifications for public mobile services within 2018.

5. There are a number of commercial deployments of LAA planned by MNOs in the United States. It is reported that T-Mobile would launch LAA on small cells to further densify its mobile network for more capacity and speed starting from the first quarter of 2018. AT&T announced that it had already deployed commercial LAA technology in Indianapolis by end of 2017 and claimed to have achieved a peak download speed of around 1 Gbps in field trials. In addition, Verizon also announced the adoption of LAA with network deployments to commence during 2018, and had already commercially deployed LAA in a city in Florida. Apart from these planned deployments, there are also news reports that major mobile operators in other countries such as Italy, Singapore, South Africa and South Korea are actively conducting trials for LAA. It is also noted that handsets supporting LAA are commercially available in overseas markets like the United States.

6. In Hong Kong, there are also keen interests from local MNOs in using the 5 GHz Shared Band to provide additional network capacity for their mobile services. One MNO has completed a technical trial on the use of the

5 GHz Shared Band for LAA, while another MNO is conducting a similar trial, which will be completed in the first half of 2018. The results of the first technical trial indicate satisfactory co-existence of LAA and Wi-Fi devices operating in the 5 GHz Shared Band in an uncoordinated and unprotected manner. Further to the above trials, the CA has received an application from an MNO for the use of LAA in the 5 GHz Shared Band for the provision of public mobile services.

PROPOSED REGULATORY AND LICENSING REGIME

7. In the Consultation Paper, the CA considers that the following issues should be taken into account in formulating the concerned regulatory and licensing regime –

- (a) while a technology neutral approach should be adhered to as far as possible, the technologies to be adopted should be widely recognised and standardised internationally in order to promote effective sharing of the spectrum for use with other devices and apparatus in the 5 GHz Shared Band. At the moment, the development of LAA appears to be more prominent and its mandatory implementation of LBT seems to be able to better ensure compatibility and more effective sharing of the 5 GHz Shared Band as compared with other available technologies using the 5 GHz Shared Band;
- (b) from the users' perspective, mobile services provided by LAA is no different from ordinary mobile services and it would be reasonable and appropriate for the operation of LAA to be licensed and regulated in a manner which is similar to the provision of public mobile services using licensed radio spectrum; and
- (c) in view of the fact that the operation of LAA would need to make use of the licensed anchor operating in the licensed mobile spectrum for control and signalling, only those Unified Carrier Licence ("UCL") holders assigned with licensed mobile spectrum

would have the capability to provide LAA in an efficient and continuous manner to the satisfaction of the CA throughout the entire 15-year tenure of their UCL.

8. With the above considerations, the CA proposes the adoption of the following regulatory and licensing regime for using the 5 GHz Shared Band for the provision of public mobile services –

- (a) 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;
- (b) 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;
- (c) only the use of LAA technology with mandatory implementation of LBT feature will be allowed initially to ensure compatibility and effective sharing with other uses and users in the 5 GHz Shared Band. When other widely recognised international standards for technologies not requiring the use of licensed anchor become available in future, 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. Such applications will be considered on a case by case basis; and
- (d) 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 intra-band in an uncoordinated manner.

PROPOSED AMENDMENT TO THE HONG KONG TABLE OF FREQUENCY ALLOCATION

9. The Hong Kong frequency allocation for the 5725 – 5850 MHz sub-band is currently not allocated for mobile services. If the 5 GHz Shared

Band, including the 5725 – 5850 MHz sub-band, is to be used for the provision of public mobile services in Hong Kong, amendment to the Hong Kong Table of Frequency Allocations is required.

10. The CA therefore proposes in the Consultation Paper to allocate the 5725 – 5850 MHz band to mobile services on a primary basis under the Hong Kong Table of Frequency Allocations, pursuant to section 32H of the Telecommunications Ordinance. Such allocation is in line with the frequency allocation of the International Telecommunication Union for the specific utilisation in Mainland China.

WAY FORWARD

11. The CA will take into consideration all the views and comments received in the public consultation before finalising its decision on the subject matter.

VIEWS SOUGHT

12. Members are welcome to express their views and comments on the proposals and may make written submissions to the CA in response to the Consultation Paper on or before the deadline of 1 March 2018.

**Office of the Communications Authority
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