

**The Views and Comments of China Mobile Hong Kong Company Limited
("CMHK")**

to

Consultation Paper

of

**Proposed Allocation of the 26 GHz and 28 GHz Bands to Mobile Service
and the Associated Arrangements for Spectrum Assignment
and Spectrum Utilisation Fee**

Issued on 26 July 2018

Question 1: What are your views on the proposed allocation of the 26/28 GHz bands to mobile service and of the sub-band of 24.25 – 24.45 GHz to fixed service, both on a primary basis? What are your views on the protection of radio stations of co-primary users on a first-come-first-served basis?

CMHK: According to 3GPP specification, n257 and n258 bands are 26.5GHz–29.5GHz and 24.25GHz–27.5GHz respectively. CA can consider to allocate the full bandwidth of 5.25GHz in these two NR bands (24.25GHz to 29.5GHz) for 5G network deployment in Hong Kong. Japan and Korean also have mmWave band frequency allocation up to 29.5GHz for 5G. Therefore, CMHK has the view that the full 26/28GHz bands with total bandwidth of 5.25GHz should be made available for assignment to mobile and fixed service.

CMHK has no comment on the proposed protection of radio stations of co-primary users on a first-come-first-served basis. In order to assess the potential impact of 5G deployment, CMHK requests OFCA to disclose the current usage of FSS in the allocated ranges.

Question 2: Do you have any views on adopting an administrative assignment approach for the release of spectrum in the 26/28 GHz bands?

CMHK: CMHK agrees with adopting an administrative assignment approach.

Question 3: Do you have any views on the proposed band plan with frequency slots of 100 MHz each?

CMHK: It is suggested that the frequency bands should be assigned in line with 3GPP standard assignment of n257 & n258 bands. In order to realize the full capacity of 5G NR mmWave equipment, CMHK counter-proposes a channel bandwidth of 400MHz for large scale public 5G services, and the remaining 100MHz can be assigned for shared use, if necessary. It makes a total of 10 frequency slots available for assignment to large scale public 5G services, plus 1 slot for shared use.

Table 5.2-2: NR operating bands in FR2 of 3GPP TS 38.104 V15.2.0 (2018-06)

NR operating band	Uplink (UL) and Downlink (DL) operating band BS transmit/receive UE transmit/receive F_{UL_low} – F_{UL_high} F_{DL_low} – F_{DL_high}	Duplex Mode
n257	26500 MHz – 29500 MHz	TDD
n258	24250 MHz – 27500 MHz	TDD
n260	37000 MHz – 40000 MHz	TDD
n261	27500 MHz – 28350 MHz	TDD

Question 4: Do you have any views on the proposal of assigning (a) 3300 MHz to 3700 MHz of spectrum in the 26/28 GHz bands for the provision of large scale public 5G services; and (b) the remaining 400 MHz to 800 MHz of spectrum in the two frequency bands to other entities for the provision of 5G services in specified locations on a shared basis?

CMHK: The proposed provision of 5G services in specified locations on a shared basis will lead to under-utilization of the shared spectrum. This is contradict to the Spectrum Policy Objective of facilitating the most economically and socially efficient use of spectrum with a view to attaining maximum benefit for the Community. We recommend that no spectrum should be allocated for shared use.

If CA still proposes the allocation of shared spectrum, CMHK suggests that it only assign 100MHz for purposes limited to academic or research development for the reason that there should not be much capacity need for such purposes. The shared spectrum should not be deployed for commercial purpose.

Question 5: Do you have any views on the proposed caps of (a) 800 MHz of spectrum in the 26/28 GHz bands for spectrum designated for the provision of large scale public 5G services; and (b) 400 MHz of the Shared Spectrum designated for the provision of specified location services?

CMHK: CMHK agrees with the proposed cap of 800MHz for the provision of large scale public 5G services, while counter-proposes no shared spectrum or only 100MHz of shared spectrum for the provision of specified location services.

Question 6: What are your views on the proposed method of assigning spectrum in the 26/28 GHz band to qualified applicants for the provision of large scale public 5G services?

CMHK: As the business initiative of 5G network services at mmWave bands in Hong Kong is still unclear, CMHK opines that CA should fairly assign the spectrum to applicants without charging SUF initially. In consideration of the 75% of threshold for charging SUF, the first assignment of spectrum is proposed as below:

Number of applicants	Assignment per applicant
1 to 3	800MHz
4 to 7	400MHz

As there will be spare spectrum left after the first assignment as proposed above, any applicant may apply for more frequency slots (i.e. @400MHz in our suggestion for Q3) in the next SUF review (i.e. every 5 years). In application of additional frequency slot, the applicant must prove that the existing assigned spectrum has been highly utilized (say over 80%) and more spectrum is needed for capacity expansion. This will align with the Spectrum Policy Objective of facilitating the most economically and socially efficient use of spectrum with a view to attaining maximum benefit for the Community.

If 8 or more applicants show interest in 26GHz/28GHz in the first assignment, the proposed method of assignment in this consultation paper could be adopted.

Nevertheless, CMHK has some queries on the CA proposed method of assignment in this paper.

- Please clarify how the drawing lots will be handled as mentioned in item 31, when the number of frequency slots available for distribution in the next round is less than the number of remaining applicants. Will the applicant applied for more spectrum get more chance during the drawing lots, i.e. more number of draws?
- Item 32 states the use of drawing lots to decide the exact positions of frequency slots assigned. How will this be managed as the applicants may be assigned with different number of frequency slots, i.e. different spectrum bandwidth? Will it end up that some applicants may have non-continuous spectrum frequency slots? If this happened, it is suggested that CA should request the involved applicants to cooperate and shift the frequency assignment, so that all applicants will end up with continuous spectrum frequency slots.

Question 7: Do you have any preference on the assignment of spectrum in either the 26 GHz or 28 GHz band?

CMHK: In consideration of device chipset support availability, it is preferred to assign n257 band first. For example, Qualcomm's mmWave Antenna module QTM052 supports 26.5-29.5GHz but not 24.25-26.5GHz.

(Reference: <https://www.qualcomm.com/products/qtm052-mmwave-antenna-modules>)

Also, in future assignment of new frequency slots in 26GHz/28GHz bands, it is highly recommended that CA will request the existing licensees to co-operate and shift the frequency slots so that all operators can end up with continuous spectrum frequency slots (existing + new slots).

Question 8: What are your views on the proposed assignment method for the Shared Spectrum?

CMHK: CMHK don't support the allocation of Shared Spectrum.

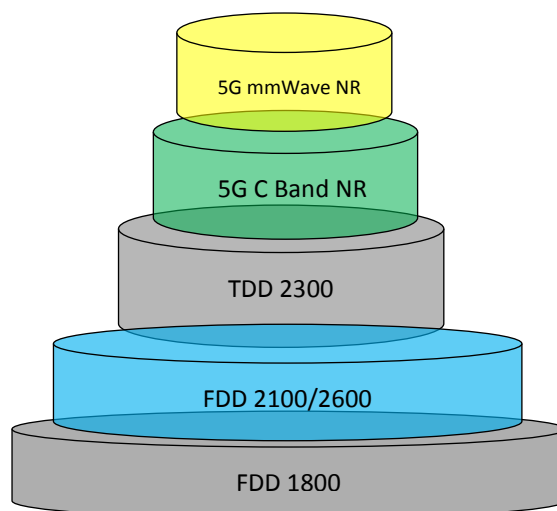
If CA still proposes the allocation of Shared Spectrum, the proposed aggregate network coverage of no more than 50 square kilometers is considered too large. If the Shared Spectrum is limited to the use for academic or research development at campus or specific locations, the aggregate network coverage should be no more than 2 square kilometers (as a reference, the campus sizes of Hong Kong Science Park and Chinese University of Hong Kong is about 0.22 and 1.73 square kilometers respectively).

Question 9: What are your views on the network and service rollout obligations proposed to be imposed on the use of spectrum assigned for the provision of large scale public 5G services?

CMHK:

1. The requirement of installing 5000 radio base stations in five years is too high and unacceptable.
2. Due to the radio characteristics of 26GHz/28GHz, it is generally accepted that 5G New Radio ("NR") at this band should be used at hot spot locations that required high speed communication or high usage demand. Taking into the fact that there are other bands (3.5GHz, 4.9GHz) for 5G network deployment, mmWave bands

can be used as a compliment to the other Sub-6Gz 5G NR bands and 4G system. C-Band 5G NR is more suitable than mmWave 5G NR for large scale deployment.



3. 5G Standard (3GPP Release 15) for NSA and SA architecture has just been released in December 2017 and June 2018 respectively. It is believed that most of equipment vendor product are in developing stage and cannot fully support SA architecture at the first half of 2019. Large scale deployment of 26GHz/28GHz sites will be highly dependent on the availability of 5G NR.
4. Installation of 5G NR at lamp pole is considered as one of the popular scenario in 5G deployment. However, there has not been any CA suggestion of enhanced process to speed up the 5G NR approval. With the past experience, an application of installing base station at lamp pole location could involve the approval of many government departments and may take over two years for the application process. There has not been any CA suggestion of enhanced process to speed up such 5G NR approval, it will be impossible for OFCA to handle many applications from operators.
5. With the advance of technology, the form factor of 5G NR is different from existing 2G/3G/4G radio base stations. Traditionally, a site is composed of baseband unit, radio unit and antenna. 5G NR is an integrated unit with Massive MIMO antenna and radio part. Baseband unit can be pooled and centralized at hub sites (C-RAN). The definition of radio base station become unclear in 5G. CMHK suggests using number of NR as service rollout obligation.

6. With the above points, it is suggested that the network and service rollout obligation to be reduced to 1000 5G NR in 5 years without annual obligation of additional base stations.

Instead of no rollout obligation for the shared spectrum, CA can have the right to take back the assignment if the assignee cannot fulfil the network & service rollout plan in the submission.

Question 10: What are your views on the proposed performance bond for guaranteeing compliance with the proposed network and service rollout obligations for using spectrum assigned for the provision of large scale public 5G services?

CMHK: The proposed performance bond set at \$1 million per MHz of assigned spectrum is too high for mmWave bands which are normally assigned with large bandwidth. CMHK counter-proposes to set the performance bond for each frequency block/slot of assigned spectrum (i.e. @400MHz in our suggestion for Q3) at \$50 million, similar to previous spectrum licenses.

Considering the difficulty in fulfilling the rollout obligation milestones based on past experience, the proposed forfeiture mechanism is not acceptable. We suggest that CA assesses the fulfilment of the milestones in one go at the end of the five year period.

Question 11: Do you have any views on the proposal for SUF as set out in paragraphs 45 to 50 above?

CMHK: As proposed in our feedback for Question 1, we suggest allocating the whole bandwidth of 26GHz & 28GHz bands in this assignment, and the 75% of threshold be calculated on a basis of 5.25GHz instead of 4.1GHz of available bandwidth.

As mentioned in items 41 & 42, the proposed SUF charging scheme will follow the regulations and decisions made by SCED and the former TA in year 2011. The level of SUF was determined by evaluating the opportunity cost for spectrum assigned administratively. In items 3 & 4, CA does quote that the proposed 26GHz band will be free up by April 2019 while 28GHz band has not been used though it has been allocated for FSS and fixed service. It implies that the concerned 26GHz/28GHz spectrum is rarely used for other purposes, CMHK therefore opines that the opportunity cost of the concerned spectrum is minimal. The SUF should not simply copy that of

spectrum allocated for the fixed service and FSS. A much lower SUF should be set to reflect the minimal opportunity cost to the Hong Kong society as a whole, and also encourage the industry to invest for 5G development to support Smart City initiatives in Hong Kong.

By saying “no SUF will be charged for 2019, 30% payable for 2020, 70% payable for 2021, and the full amount payable for 2022 and beyond”, our interpretation is “no SUF for the period 1 April 2019 to 31 March 2020, 30% SUF for the period for the period 1 April 2020 to 31 March 2021 and 70% SUF for the period 1 April 2021 to 31 March 2022”, if the 26GHz/28GHz is assigned in 1 April 2019. CMHK would like CA to clarify the interpretation.