

**For discussion on
9 November 2020**

**Legislative Council
Panel on Information Technology and Broadcasting**

**Facilitative Measures for Telecommunications Operators to
Extend Mobile Network Coverage**

Purpose

This paper briefs Members on the Government's facilitative measures for telecommunications operators to extend mobile network coverage, in particular the strategies on 5G development in Hong Kong.

Background

2. Hong Kong entered the 5G era this year. Mobile network operators (MNOs) launched commercial 5G services in the second quarter. 5G technology will revolutionise mobile users' experience with its capabilities for high speed, high capacity, reliability, massive connectivity and low latency communications. 5G will also open up vast potential for various innovative commercial and smart city applications.

Overview of 5G Development

3. All MNOs in Hong Kong (including Hong Kong Telecommunications, Smartone, Hutchison and China Mobile Hong Kong) launched commercial 5G services respectively in the second quarter of this year, and have been having good progress in different aspects. In terms of 5G network coverage, MNOs target to extend the coverage of 5G networks to 90% within this year; and an operator has already extended 5G coverage to over 50 major Mass Transit Railway

stations. Regarding supply of 5G mobile phones, there are over 20 models available in the market targeting different users, with prices ranging from around \$2,000 to over \$10,000. As major brands launched their new basic or flagship models of 5G products at varying prices, it is expected that user's incentives for subscribing to 5G service will be increased. In terms of service fees, operators also provide various 5G service plans. Depending on data usage¹, the monthly charge ranges from below \$200 to over \$700, and users can choose the appropriate service plans according to their respective needs.

Government's Facilitative Measures

4. To promote the development of 5G in Hong Kong, the Government has implemented a series of measures to facilitate the extension of 5G networks and services -

Spectrum Supply

5. Radio spectrum is the foundation for the provision of telecommunications services. 5G requires the co-ordination of spectrum in high, mid and low frequency bands to satisfy the need of various 5G services in terms of speed, capacity and coverage.

6. To enable the early launch of 5G services by operators, a total of about 2 000 MHz of 5G spectrum was assigned to the operators in 2019. We plan to further supply a total of 2 700 MHz of spectrum in different bands (including spectrum in the 600 MHz and 700 MHz low-band, the 4.9 GHz mid-band, and the 26 and 28 GHz high-band) in 2021 to satisfy the future demand of the telecommunications market and support the continuous development of mobile telecommunications services in Hong Kong.

7. In accordance with the technology-neutral principle, operators may re-farm some of their existing spectrum flexibly for 2G/3G/4G/5G services according to their respective commercial strategies. We will also continue to monitor technological and market

¹ From 8 GB to 300 GB

development to prepare for the future supply of spectrum and timely make more suitable spectrum available for the development of 5G and other innovative services.

Solving the Problem of the 5G Restriction Zone

8. Among the different frequency bands which may support 5G services, the 3.5 GHz band possesses good radio propagation characteristics and can provide extensive mobile network coverage. Considering that spectrum in the 3.5 GHz band has been used for the provision of fixed satellite service, the Communications Authority (CA) restricts the operation of 5G mobile base stations (base stations) at the 3.5 GHz band in areas with earth stations for telemetry, tracking and control (TT&C) of satellites (i.e. Tai Po and Stanley) to prevent interference when re-allocating the 3.5 GHz band to mobile services in April 2020.

9. To promote the overall 5G development in Hong Kong, we have been proactively discussing with two satellite operators the relocation of affected facilities in their TT&C stations currently in Tai Po. At present, the tenancy for one of the operators has been approved by the Lands Department for the relocation of relevant facilities to Chung Hom Kok Teleport. The other operator is discussing details with various departments, which is in good progress. Having considered the time required for specific planning and relocation works, we expect that the problem of the 3.5 GHz restriction zone in Tai Po will be thoroughly solved within the next few years. Prior to that, MNOs may make use of other 5G bands (e.g. 4.9 GHz) or re-farm existing spectrum (e.g. 2.1 GHz) to provide 5G services in the 3.5 GHz restriction zone in Tai Po.

Supporting the Upgrade of Satellite Master Antenna Television (SMATV) Systems

10. Besides satellite earth stations, satellite television systems also used the 3.5 GHz band to provide services. Therefore, after the re-allocation of the 3.5 GHz band, existing SMATV systems also need to undergo technical upgrades in order to co-exist with 5G systems.

11. To solve such problem, the Office of the Communications Authority (OFCA) has launched a subsidy scheme to offer a subsidy of \$20,000 each to some 1 600 eligible SMATV systems in Hong Kong for implementing technical upgrades² so that the public effected can continue to receive satellite television services.

Facilitating the Roll out of 5G Networks

12. To provide territory-wide 5G service, telecommunications operators need to establish a larger number of base stations as compared with previous generations of mobile services. To facilitate the expeditious and effective roll-out of 5G networks by telecommunications operators, we strive to assist operators to install base stations for extension of 5G network coverage.

13. Currently, operators have installed base stations at some 10 000 locations in Hong Kong, about 400 of which are government premises. OFCA pioneered the launch of a pilot scheme in March 2019 to open up more than 1 000 suitable government premises for operators to install base stations with streamlined application processes and nominal rental (\$1 per year). We have also assisted operators to apply for the use of more government premises by a “demand-led” model, as well as opened up suitable public facilities such as sheltered bus stops, public payphone kiosks and smart lampposts. Including those installed in private properties, OFCA has approved more than 2 000 5G base stations since 2019 and the progress is satisfactory.

14. To further facilitate the installation of base stations by operators, OFCA has worked with the Buildings Department to streamline the approval processes for installation of telecommunications facilities like antennas and transceivers of 5G small cell sites on external walls of buildings³, with a view to ensuring

² The subsidy scheme, lasting for one year, accepts applications from 27 November 2019 to 26 November 2020. It was collectively funded by all successful spectrum assignees of the 3.5 GHz band, i.e. the four MNOs, while OFCA administered the subsidy scheme on their behalf.

³ To streamline the approval processes by including the metal supporting frames for antennas and transceivers for public telecommunication services projecting from the external walls of buildings as minor works (with certain limitations on the projection of the frame and the weight of the antenna/transceiver).

building safety while expediting the approval for the relevant minor works.

15. On facilitating 5G indoor coverage, we are also preparing to set up a user-friendly web-based platform next year for low-power indoor base stations⁴ to facilitate operators' self-service registration, for which immediate approval will be given. This would expedite the installation of 5G indoor base stations (e.g. those in shopping malls, conference venues, commercial buildings, etc.), extension of network coverage and enhancement of capacity by operators. We estimate that about 2 000 relevant indoor base stations will be benefitted.

Ensuring the Radiation Safety of Base Stations

16. With the rapid development of public mobile services, we understand the public's concerns on radiation safety of base stations. The CA has adopted the non-ionising radiation safety limits set by the International Commission on Non-ionizing Radiation Protection (ICNIRP) and recognised by the World Health Organization as the radiation safety standards for base stations to ensure that the radiation level does not affect the public.

17. According to conditions of telecommunications licences, operators are required to obtain approvals from the CA before bringing their base stations into operation. In vetting the applications, apart from examining the radiation level of individual base stations, the CA will also take into account the total radiation level of all base stations installed at the same location to ensure that the total radiation level complies with the safety limits set by the ICNIRP before granting approval for these applications. One month after the commissioning of a base station, the operator must submit an on-site measurement report to prove that the radiation level of the base station complies with safety requirements.

⁴ i.e. indoor public mobile services base stations with power not exceeding 2 watts (equivalent isotropically radiated power (EIRP)). As advised by the International Telecommunication Union, such low-power base stations meet the radiation safety requirements of the ICNIRP.

18. In addition, over the past three years, in response to requests of Legislative Council Members, District Council Members and members of the public, OFCA has conducted over 1 100 measurements of radiation level in residential premises throughout the territory, and has initiated random checks on more than 5 800 approved base stations. No cases have been found to exceed the radiation safety standards. OFCA will continue to conduct on-site measurements of radiation level and step up publicity and education on base station radiation safety to avoid unnecessary public anxiety.

Extending Broadband Services in Remote Areas

19. For remote villages located in the New Territories and on outlying islands, the progress of extending network coverage by telecommunications operators has been slow and unsatisfactory due to the high costs of network roll-out and the small number of subscribers. Hence, we launched a subsidy scheme encourage telecommunications operators to extend fibre-based networks to villages in remote areas.

20. OFCA completed the tender exercise of the scheme this year. Telecommunications operators are now carrying out the network extension works in a progressive manner, and the new fibre-based networks are expected to be extended to 235 villages in phases from 2021 onwards, benefitting about 110 000 villagers. The subsidy scheme not only helps extend fibre-based networks to villages but also provides the backbone infrastructure for extension of 5G coverage, thereby expediting the extension of 5G mobile networks to remote areas.

Subsidising Early Deployment of 5G Technologies

21. To encourage early deployment of 5G technologies across trades and industries for improving efficiency, productivity and quality of service, we have earmarked a total of \$60 million under the Anti-Epidemic Fund to provide funding support to public and private sectors for early deployment of 5G technologies during the economic uncertainty and the epidemic. The scheme subsidises 50% of costs for projects deploying 5G technologies, subject to a cap of \$500,000 for each project.

22. As at 30 October, we have received 180 subsidy applications, of which 20 applications have been approved, covering innovative applications from various industries (e.g. remote monitoring of elevators, e-sports car racing, 4K bands performance or live fitness teaching), thereby setting an example for the wider application of 5G.

Way Forward

23. Like the previous generations of mobile telecommunications services, it is expected that 5G service requires time to achieve maturity and wide adoption. We will continue to closely monitor the market situation and proactively implement appropriate measures to support 5G and smart city development.

Advice Sought

24. Members are invited to note the content of this paper and provide comments.

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