

Consultation Document on the Subsidy Scheme to Extend 5G Coverage in Rural and Remote Areas

About this Consultation Document

- This consultation document is issued by the Office of the Communications Authority (“OFCA”) to implement the initiative of the 2023 Policy Address and seek the views of relevant stakeholders on the Government’s proposal on the Subsidy Scheme to Extend 5G Coverage in Rural and Remote Areas (“Rural 5G Subsidy Scheme”). According to the proposal, the Government will proactively coordinate with mobile network operators (“MNOs”) and expedite the expansion of mobile network infrastructure in rural and remote areas through subsidies. This is intended to enhance the mobile network coverage and capacity in these areas so as to improve the quality of life of the residents in the areas and safeguard the safety of countryside activities.

- You may submit views on the issues covered in this consultation document to OFCA in any of the following ways on or before 9 August 2024:

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I. Background

Mobile communications service has nowadays become a basic and essential utility that underpins the operation of an information society. The launch and growing popularity of the 5G technology has further stimulated the development of innovative business services and smart city applications. A comprehensive mobile communications infrastructure ensures the efficient deployment of advanced mobile communications technology like 5G, which is crucial to the sustainable development of high-end economy and smart city.

2. Since the launch of 5G commercial services in Hong Kong in April 2020, 5G network coverage has now exceeded 90% of the local population, covering major urban locations and all MTR lines of 98 stations. The coverage in core business districts has even reached 99%. As of February 2024, the number of 5G users reached 6.7 million, representing about 90% of the population. According to the report of an international research organisation released in February 2024, Hong Kong's 5G Connectivity Index scores ranked the first¹ in the Asia-Pacific region.

3. The Government has implemented a number of measures to promote the development of 5G services in Hong Kong, including –

- (a) Since 2019/2020, new spectrum in various frequency bands has been released, through auctions or administrative assignments, in a timely manner for provision of 5G services by MNOs. To implement the 2023 Policy Address initiative, the Government will conduct spectrum auctions

¹ For details, please refer to the report of GSMA Intelligence published in February 2024 <https://mobileinsights.mobileworldlive.com/mwc-daily-news-2024/5g-in-2023-how-far-have-we-come>. According to the report of GSMA Intelligence, 5G Connectivity Index scores are calculated based on assessment of 5G infrastructure and 5G services. 5G infrastructure is measured by (a) amount of spectrum allocated to MNOs; (b) number of 5G radio base stations, coverage and availability of 5G networks; and (c) 5G service quality and experiences like download speeds, upload speeds, etc. 5G services are measured by (a) affordability of 5G mobile data services and devices; (b) adoption of 5G by consumers; and (c) market development in terms of data usage per subscriber and revenue growth.

for the 850/900 MHz, 2.3 GHz and the newly available 6/7 GHz bands in the fourth quarter this year, providing a total of 510 MHz of spectrum for public mobile services. MNOs who successfully acquire spectrum in the auctions can benefit from the Inland Revenue (Amendment) (Tax Deduction of Spectrum Utilization Fees) Ordinance 2024, which has taken effect since January this year, by receiving full tax deductions for the relevant spectrum utilization fees. The relevant tax incentives were proposed in the 2023-24 Budget, aiming to encourage MNOs' investment in mobile services through participating in spectrum auctions;

- (b) The Telecommunications (Amendment) Ordinance 2024 was passed in February 2024 to implement the initiative proposed in the 2022 Policy Address to promote 5G development and provides MNOs with free access to install and maintain mobile communications facilities in reserved space in specified new and redeveloped buildings;
- (c) To implement the 2023 Policy Address initiative, the Government has actively coordinated with relevant Government departments, venue managers and MNOs to enhance the 5G network capacity at major public event venues;
- (d) A pilot scheme has been launched since March 2019, opening up about 1 500 Government premises managed by different Government departments for application by MNOs to install radio base stations ("RBS") for extending 5G network with a streamlined application procedure and a nominal rent (\$1 per annum). The Government has also established a mechanism to facilitate MNOs to install RBS at sheltered bus stops, public payphone kiosks and smart lampposts; and
- (e) The Government has been implementing the Subsidy Scheme to Extend

Fibre-based Networks to Villages in Remote Areas since 2018. The subsidised, newly-built fibre-based networks are being extended to 235 villages in phases from 2021 to 2026.

4. While Hong Kong's overall 5G network coverage is among the highest in the world due to the proactive works of the Government and the industry, given the geographical span in rural and remote areas in Hong Kong as well as the ruggedness of the terrain, the existing mobile network coverage and capacity in these areas are not comparable to those in the urban areas. Moreover, as customer demand in these areas is relatively low and electricity supply facilities together with fibre-based network may not necessarily be available, MNOs lack the commercial incentive to expand their mobile network infrastructure in these areas to provide more comprehensive services, making 5G service coverage in some rural and remote areas still not satisfactory, causing inconvenience to residents and visitors in the vicinity.

II. Proposed Subsidy Scheme

5. At present, MNOs have installed RBS at 33 locations in major country parks, some outlying islands and rural/remote areas to provide mobile network coverage. According to OFCA's assessment, the current overall mobile network coverage in country parks is about 80%, lower than that in the urban areas. In addition, due to the complex geographical environment of rural and remote areas, mobile communications and network services currently available are also weaker in general. In order to facilitate the availability of more comprehensive mobile network coverage and better service quality in country parks, outlying islands and other rural/remote areas, it is necessary to expedite the installation of RBS in these areas.

6. For the above reasons, market mechanism alone will unlikely achieve the goal of significantly improving mobile network coverage and capacity in rural and remote areas within the foreseeable future. Therefore, the Chief Executive announced in the 2023 Policy Address that the Government will proactively coordinate with the MNOs and study how to expedite the expansion of mobile network infrastructure in rural and remote areas through financial subsidy to enhance the mobile network coverage and capacity in these areas so as to improve the quality of life in the areas and safeguard the safety of rural activities. The following paragraphs set out the details and specific arrangements of the proposal.

A. Eligibility

7. The Rural 5G Subsidy Scheme will provide financial incentive to MNOs to encourage them to install mobile network facilities (i.e. RBS) in rural and remote areas. All licensed MNOs in Hong Kong are eligible to participate in the Scheme². To encourage MNOs to provide services at different locations, the Government will coordinate MNOs to make applications of RBS installations after taking into account the views of major stakeholders and the actual operation of the Scheme.

B. Details and Requirements of the Scheme

Selection of RBS Site Locations

8. According to preliminary assessment, we plan to install new RBS at about 50 sites located in country parks, outlying islands and rural and remote areas in different districts (including Sai Kung, Tai Po, Islands and North District). At present, the mobile network coverage/network capacity at these locations is weak

² There are currently four major MNOs in Hong Kong, including China Mobile Hong Kong Company Limited, Hong Kong Telecommunications (HKT) Limited, Hutchison Telephone Company Limited and SmarTone Mobile Communications Limited.

or even unavailable, and the new RBS will provide 5G mobile network coverage in these areas. When selecting the locations of the relevant RBS sites, OFCA has taken into account the views of MNOs and other stakeholders. In order to promote timely implementation of the Subsidy Scheme and avoid dealing with complex land right issues in remote areas, after the initial communications with relevant Government departments, the selected RBS sites will try to make use of existing Government premises (e.g. public toilet, water pumping station, transmission station, country park visitor centre, etc.) located in these areas as far as practicable. These sites already have basic power supply and space for RBS installation and should therefore be technically feasible to build RBS. The list of preliminarily proposed RBS sites to be included in the Scheme is set out in the **Appendix**.

9. As unforeseeable technical limitations or difficulties may be encountered during installation of RBS at some of the selected sites, we also propose that MNOs be allowed to put forward alternative sites based on actual condition where necessary and replace the original ones for installation of RBS with the consent by OFCA.

10. We anticipate that, after completion and commissioning of all relevant RBS, the mobile network coverage will be enhanced to at least 90% in country parks, and even 98% in major Government hiking trails, improving countryside safety and providing convenience to the lives of residents.

Technical Requirements of RBS

11. MNOs are required to undertake that the RBS subsidised and built under the Scheme can provide 5G (or more advanced communications technology) service and provide a minimum average download speed of no less than 100Mbps. MNOs should also ensure that the installed RBS can provide stable, quality

mobile services. In case of network outages or service interruptions, MNOs will be required to proactively report to OFCA and restore the services as soon as possible within a reasonable time. OFCA will continue to monitor the mobile services provided by MNOs under the Scheme. If MNOs fail to comply with their service pledge, they will be required to return part of the subsidy received based on the actual circumstances, in order to ensure the proper use of public funds.

“Shared-use Principle” of RBS

12. OFCA will require MNOs to install and operate RBS at the selected sites based on the “shared-use principle” where practicable to ensure that every RBS can be fully utilized and provide service to more citizens. In practice, each application must be submitted by a lead MNO, who will be required to confirm in writing the willingness of other MNOs to share the site and that the lead MNO will allow other participating MNOs to install their mobile network facilities for the provision of service according to the “shared-use principle”.

13. OFCA will coordinate with all MNOs participating in the Scheme. It is envisaged that for all the selected sites under the Scheme, at least one MNO will install mobile communications facilities to provide 5G service.

C. Proposed Amount of Subsidy

14. We propose setting a uniform cap for subsidy for each RBS project, which will be provided to the lead MNO on a reimbursement basis after OFCA has verified the actual expenditure incurred. The lead MNO must submit an audit report that has been verified by an independent auditor and must complete all acceptance tasks for the RBS before the subsidy will be released. To strike a balance between the proper use of public funds and the availability of sufficient

incentive for MNOs, we propose that the subsidy amount for the RBS project at each site will be capped at HK\$2 million after making reference to the actual costs of RBS installation in remote area. Based on rough estimates, this subsidy amount cap will account for about half of the direct costs³ for the installation of an RBS.

15. Due to the higher technical complexity of installing RBS at certain sites (e.g. locations that are extremely remote lacking of suitable infrastructure facilities for installation of RBS and require additional civil engineering work), the construction costs involved may be higher. To ensure that the relevant sites will be able to attract applications from MNOs, we propose that MNOs may receive an additional subsidy of not more than HK\$2 million for these sites with relatively higher technical complexity, which will also be granted on a reimbursement basis. We estimate that 10 of the 50 currently proposed sites will be technically complex sites (see **Appendix**).

D. Mode of Implementation and Timeframe

Implementation of the Scheme in Phases

16. Since installing RBS in rural and remote areas requires the handling of a variety of technical issues (such as electricity supply facilities, loading restrictions and excavation works for laying optical fibers, etc.), for the purpose of ensuring the effective implementation of the Scheme, the Scheme is proposed to be implemented in two phases, taking into account the practical needs of MNOs on resource allocation. In general, sites that are more technically ready (e.g. there are electricity supply facilities nearby or Government premises available for installing RBS, etc.) and sites where there is a pressing need to enhance mobile network coverage (such as places that currently have no network coverage at all)

³ The indirect costs for setting up RBS (such as electricity supply, laying of fiber networks, etc.) will not be subsidised under the Scheme.

will be given priority for installation for RBS where practicable, so as to ensure the public can benefit as soon as possible.

17. According to preliminary assessment, among the 50 RBS sites mentioned in paragraph 8 above, 30 of which (see **Appendix**) will be included in Phase I implementation of the Scheme for MNOs to make applications. For the remaining sites, some are undergoing other construction works and some may require further technical feasibility studies before RBS can be installed. These sites will be made available for MNOs' application for RBS installation after the completion of relevant works or assessment, and hence they will subsequently be made available in Phase II implementation.

Implementation Timetable

18. We propose that each RBS should be installed and put into service within the next 12 months after the application is approved by OFCA. OFCA will require MNOs to submit regular written reports on the progress of RBS installation and conduct site inspections from time to time to closely monitor the construction and implementation progress of the approved projects to ensure that the new RBS subsidised under the Scheme can be put into service as scheduled.

19. In addition, as installation of RBS in rural and remote areas may require various technical approvals from different Government departments (such as the Architectural Services Department, Electrical and Mechanical Services Department, Planning Department, Environmental Protection Department, Agriculture, Fisheries and Conservation Department, etc.), OFCA will also proactively coordinate the processing by various departments and actively provide assistance to MNOs so that they can obtain relevant approvals as soon as possible in compliance with the relevant requirements. This is to ensure that the RBS can be installed and provide service as planned.

Key Performance Indicator

20. According to the above implementation deadline and taking into account the complexity of engineering works at certain selected sites, we expect that the installation of RBS subsidised under the Scheme can be completed and put into service within four years after launch of the Scheme. The preliminary performance indicators are as follows:

Milestone	Accumulated number of installed RBS
Within one year after launch of Scheme	15 (30% of all RBS)
Within two years after launch of Scheme	25 (50% of all RBS)
Within three years after launch of Scheme	40 (80% of all RBS)
Within four years after launch of Scheme	50 (All completed)

E. Other Matters

Protection of Surrounding Environment

21. When constructing RBS in rural and remote areas (especially country parks), it is necessary to ensure the protection of surrounding environment. In fact, MNOs were required to comply with all relevant regulations when installing RBS at different locations in the past, including regulations related to environmental protection. They were also required to make appropriate arrangements to reduce the impact of the RBS installation work on the surrounding environment, nearby residents and other members of the public. OFCA will ensure that MNOs shall comply with relevant regulations during the installation of RBS.

22. In addition, MNOs are also required to take appropriate measures to address visual impact concerns, such as adopting appropriate exterior designs to match and blend in with the appearance of the building as far as possible, and minimizing the space occupied as far as practicable, so as to reduce the negative visual impact on the surrounding environment by the RBS equipment.

Radiation safety

23. At present, OFCA has a regulatory mechanism to ensure that the RBS will not cause radiation safety concerns. MNOs are required to strictly comply with the non-ionising radiation (“NIR”) safety limits⁴ set by the International Commission on Non-ionizing Radiation Protection (“ICNIRP”) and obtain approval from the Communications Authority (“CA”) for bringing the RBS into operation after passing the compliance test. MNOs are also required to submit a further measurement report to OFCA within one month after the RBS is put into service to demonstrate that the radiation levels meet the safety standards. Furthermore, OFCA will conduct random checks on the radiation levels of approved RBS from time to time so as to protect public health. Upon request by members of the public, OFCA will also conduct on-site inspections and measure radiation level, and explain the measurement results. Over the past three years, OFCA has conducted nearly 900 radiation level measurements on radiation level in residential premises throughout the territory at the request of the public. It has also proactively performed random checks on the radiation level of nearly 10 000 RBS. In the above measurements, OFCA found no violation of the radiation safety standard. The CA will also consult the Department of Health from time to time to obtain professional advice to keep abreast of the latest development of the radiation safety standards. OFCA will continue, through publicity and public

⁴ The CA has, in accordance with the recommendation of World Health Organisation and Department of Health, adopted the NIR limits as set by the ICNIRP as the approval criteria for RBS. ICNIRP limits or similar requirements are commonly adopted by many of the developed economies and economies with dense population, such as Germany, France, the United States, the United Kingdom, Australia, New Zealand, Japan, Singapore and Korea, as their radiation safety standards.

education, to address public concerns about radio radiation safety.

III. Way Forward

24. OFCA will examine the views collected in details to finalise the specific arrangements for implementing the Scheme, with a view to seeking the Legislative Council's approval for the relevant funding as soon as possible and officially launching the Scheme within 2025 for applications by MNOs.

Office of the Communications Authority

July 2024

**Preliminarily Proposed RBS Sites to be Included
in the Subsidy Scheme**

Site	Name of RBS Site	Potential Venues within the Site Areas for RBS Installation	Intended Coverage Areas/Districts by the RBS
Phase I RBS Sites			
1	Big Wave Bay	Big Wave Bay Beach Facilities	Southern District
2	Cheung Sha	Cheung Sha Fire Station	Islands District
3	Fong Ma Po	Fong Ma Po Public Toilet	Tai Po District
4	Hau Tong Kai	Hau Tong Kai Public Toilet	Tai Po District
5	Hok Tau	Hok Tau Road Public Toilet	North District
6	Ko Lau Wan	Ko Lau Wan Public Toilet	Tai Po District
7	Ko Tong Ha Yeung	Ko Tong Ha Yeung Public Toilet	Tai Po District
8	Kuk Po	Kuk Po (Lo Wai) Public Toilet	North District
9	Lai Chi Wo	Lai Chi Wo Public Toilet	North District
10	Lin O	Lin Au Public Toilet	Tai Po District
11	Lin Tong Mei	Lin Tong Mei Public Toilet	North District
12	Man Uk Pin	Man Uk Pin Public Toilet	North District
13	Ngar Yiu	Ngar Yiu Public Toilet	North District
14	Pak Tam Chung	Pak Tam Chung Lowland Raw Water Pumping Station	Sai Kung District
15	Sai Wan	Sai Wan Public Toilet	Sai Kung District
16	Sha Kiu Tau	Sha Kiu (Leung Shuen Wan) Public Toilet	Sai Kung District
17	Sha Lo Wan	Sha Lo Wan Automatic Weather Station	Islands District

Site	Name of RBS Site	Potential Venues within the Site Areas for RBS Installation	Intended Coverage Areas/Districts by the RBS
18	Sha Tau Kok Boundary Areas	Sha Tau Kok Fire Station	North District
19	Shek Lei Pui	Shek Lei Pui Water Treatment Works	Sha Tin District
20	Shek Uk Tsai	Tai Po Water Treatment Works	Tai Po District
21	Ta Kwu Ling Boundary Areas	Ta Kwu Ling Public Toilet	North District
22	Ta Tit Yan	Ta Tit Yan Fresh Water Pump House	Tai Po District
23	Tai O Country Side	Tai O Water Treatment Works	Islands District
24	Tai Sang Wai	Tai Sang Wai Public Toilet	Yuen Long District
25	Tai Tam Tuk Reservoir	Tai Tam Road Beach Store Room	Southern District
26	Tai Tam Upper Reservoir	Tai Tam Reservoir Road Public Toilet	Eastern District
27	Tai Tan	Tai Tan Public Toilet	Tai Po District
28	Tsiu Hang	Lions Nature Education Centre	Sai Kung District
29	Wong Chuk Yeung	Wong Chuk Yeung Fresh Water Pump House	Sha Tin District
30	Yung Shue O	Yung Shue O Public Toilet	Tai Po District
Phase II RBS Sites			
1	Chuk Yuen	Chuk Yuen Village Public Toilet	North District
2 *	Clear Water Bay	Clear Water Bay Country Park Visitor Centre	Sai Kung District
3 *	Cloudy Hill	Cloudy Hill Transmission Station	Tai Po District
4 *	Ham Tin Wan	Ham Tin Public Toilet	Sai Kung District
5 *	Kat O	Kat O Public Toilet	North District
6 *	Lamma Island Ling Kok Shan	Lamma Island Ling Kok Shan Transmission Station	Islands District
7 *	Lau Shui Heung Reservoir	Lau Shui Heung Reservoir Public Toilet	North District

Site	Name of RBS Site	Potential Venues within the Site Areas for RBS Installation	Intended Coverage Areas/Districts by the RBS
8	Lin Ma Hang	Lin Ma Hang Public Toilet	North District
9	Muk Wu	Muk Wu Tsuen Public Toilet	North District
10	Sam A	Sam Ah Public Toilet	North District
11	San Tau	San Tau Public Toilet	Islands District
12 *	Sha Lo Tung	Sha Lo Tung Countryside Conservation Facilities	Tai Po District
13	Shap long	Shap Long San Tsuen Public Toilet	Islands District
14	Shing Mun Reservoir	Shing Mun Country Park Visitor Centre	Tsuen Wan District
15	Tai Lung	Tai Lung Farm Facilities	North District
16	Tai Mei Tuk	Tai Mei Tuk Public Toilet	Tai Po District
17 *	Temple Hill	Temple Hill Transmission Station	Sha Tin District
18 *	Tin Fu Tsai	Tin Fu Tsai Fire Lookout	Tuen Mun District
19	Wong Yi Chau	Wong Yi Chau Public Toilet	Sai Kung District
20 *	Yuen Tun	Tsing Lung Tau Public Toilet/CAS Yuen Tun Camp	Tsuen Wan District

Notes

1. This **Appendix** sets out the preliminarily proposed RBS sites, which may be subject to changes, after taking into account the outcome of technical studies and the views of MNOs, relevant stakeholders and relevant Government departments.
2. The 10 RBS sites marked with “*” are preliminarily considered technically complex sites as mentioned in paragraph 15 of the consultation document, which may involve additional work or procedure for RBS installation at these sites, e.g. extra civil engineering work due to the lack of infrastructure, accessibility and consultancy studies required for environmental impact assessment or seeking planning permission by Town Planning Board, etc.
3. Site no. 18 under Phase II, i.e. Tin Fu Tsai, is located at the boundary of Tuen Mun District and Yuen Long District. Although the site is within Yuen Long District, the

proposed RBS can also provide mobile services to the rural and remote areas (including underserved hiking trails) in the Tuen Mun District.