

**For discussion
on 13 January 2020**

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

Hong Kong's External Telecommunications Connectivity

Purpose

This paper briefs Members on the current situation of Hong Kong's external telecommunications connectivity and reports on its future development.

Background

2. As a major telecommunications hub in the region, Hong Kong has sound and excellent external telecommunications infrastructure, including well-established submarine optical fibre cable systems, overland optical fibre cable systems and communications satellites, as well as submarine cable landing facilities and satellite earth stations.

3. Optical fibre cables, characterised by their huge capacity, are mainly used for transmitting voice, video and data signals. Through optical fibre cable networks, Hong Kong is connected to data centres, servers and relevant platforms around the world, with access to various online services and applications, and supporting business activities of various trades and industries. Currently, more than 99% of Hong Kong's external telecommunications network capacity is provided by optical fibre cable systems (including submarine optical fibre cables connecting to the Asia-Pacific region, Europe and North America, and overland optical fibre cables connecting to the Mainland), of which 78% is provided by submarine optical fibre cables, which play a critical role in supporting Hong Kong's external telecommunications services and development.

4. As for communications satellites, while their capacity is smaller than that of optical fibre cable systems which provide point-to-point telecommunications services, they are characterised by their wide coverage which can provide users in the Asia-Pacific region (including relatively remote areas) with satellite telecommunications and television broadcasting services. Hence, they play an equally important role in establishing Hong Kong as a diversified regional telecommunications hub.

Current Market Overview

5. Since the liberalisation of the external facility-based telecommunications market in 2000, Hong Kong has been adopting an open licensing framework¹. No pre-set limit on the number of licences and no foreign ownership restrictions are imposed on the operators, allowing free competition in the market. Currently, Hong Kong's external telecommunications market is flourishing. There are 42 external fixed network operators, operating external telecommunications facilities with a total of 11 external submarine optical fibre cable systems, 20 overland optical fibre cables and 11 communications satellites. Moreover, there are 183 service-based external fixed network operators which hire other operators' facilities for provision of services.

6. Hong Kong holds a leading position internationally in terms of capacity of its external telecommunications facilities. As at end-September 2019, the total equipped capacity² of the above-mentioned external telecommunications facilities was 89.6 terabits per second (Tbps), representing a cumulative increase of more than 400% over the past five years. Hong Kong's external telecommunications capacity has long been abundant. The equipped capacity of the existing external telecommunications infrastructure accounts for only a small fraction (about 11%) of the overall designed

¹ For the provision of external fixed services, an interested party may apply for a Unified Carrier Licence (External) from the Communications Authority (CA).

² Equipped capacity refers to the capacity of the external circuits which are equipped with the necessary termination equipment so that the capacity is readily available to customers.

capacity. It has not only fully satisfied the demand of the telecommunications industry in the past, but it also expects to meet Hong Kong's medium to long-term external telecommunications demand.

Future Development

7. With the rapid development of communications technologies and the high speed, high traffic services and various smart applications expected to be brought about by the fifth generation mobile telecommunications technology (5G), it is anticipated that the demand for external telecommunications services in Hong Kong will continue to increase. In view of this, in order to further enhance Hong Kong's status as a regional telecommunications hub, the industry has in recent years been committed to enhancing the capacity of the existing optical fibre cable systems and establishing more submarine optical fibre cable systems so as to get well prepared for the ever-increasing external telecommunications demand in the future.

Facilitating the Construction of Submarine Optical Fibre Cable Systems

8. The Office of the Communications Authority (OFCA) provides operators interested in laying submarine optical fibre cables with a one-stop single-point-of-contact service, assisting them in coordinating with relevant government departments and obtaining required approvals³. At present, eight new external submarine optical fibre cable systems are being planned or constructed, and are expected to land in Hong Kong and put into service gradually from this year to 2023.

9. According to preliminary assessment, after the relevant optical fibre cable systems are put into service, the capacity of Hong Kong's external telecommunications networks will more than double the current capacity. There will be more diversified external

³ including those granted by the Lands Department, the Marine Department, the Town Planning Board, the Environmental Protection Department, etc.

connectivity, significantly enhancing Hong Kong's capability and reliability of handling external telecommunications.

Providing Land at Chung Hom Kok Teleport for External Telecommunications Infrastructure

10. Over the past two years, some fixed network operators have expressed to OFCA or the Lands Department their interest in constructing additional external telecommunications infrastructure in Hong Kong, in order to reinforce Hong Kong's role as a regional telecommunications hub and financial centre, and support the Belt and Road Initiative and the development of the Guangdong-Hong Kong-Macao Greater Bay Area into an external hub of innovation and technology.

11. To this end, in the 2019 Policy Address Supplement, the Chief Executive has proposed to provide suitable land lots in Chung Hom Kok Teleport for external telecommunications infrastructure, with a view to further enhancing the overall capacity and diversity capability of Hong Kong's external telecommunications networks. Situated in Southern District of Hong Kong and with a total area of about 2.5 hectares, Chung Hom Kok Teleport is the only piece of land currently designated for external telecommunications facilities, suitable for the construction of submarine optical fibre cable landing facilities and satellite earth stations.

12. The construction of an external telecommunications system is a major investment project. The works involved (e.g. exploration of the sea area concerned, laying and landing of optical fibre cables, etc.) normally take several years. The Commerce and Economic Development Bureau (CEDB) and OFCA are coordinating with relevant bureaux and departments on the preparatory work such as the grant of land, so that operators can materialise their investment in the construction of external telecommunications facilities in Hong Kong as early as possible.

13. Meanwhile, given the concern about the 5G restriction

zone in Tai Po⁴, we are proactively exploring with satellite operators the feasibility of relocating the existing satellite earth stations for telemetry, tracking and control of satellites in orbit from Tai Po to Chung Hom Kok Teleport. We expect to maintain the long-term development of our satellite industry as an important external telecommunications industry on the one hand, and fully resolve the problem of the restriction zone in Tai Po in the long run on the other, so that mobile network operators can make wider use of all 5G bands (including the 3.5 GHz band) in Hong Kong for the provision of services. That said, we must add that apart from the 3.5 GHz band, operators may also make use of other 5G bands (e.g. the 3.3 GHz, 4.9 GHz and 26/28 GHz bands) or re-farm spectrum in other bands used for providing the second to the fourth generation mobile services under their existing licences to provide 5G services in different districts of Hong Kong including Tai Po and nearby districts.

14. CEDB and OFCA will continue to monitor the market demand for and supply of external telecommunications infrastructure and facilities to provide facilitation for the industry as appropriate in advance and support the continual development of Hong Kong as a regional telecommunications hub.

Advice Sought

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

**Communications and Creative Industries Branch
Commerce and Economic Development Bureau
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⁴ From 1 April 2020, the CA will re-allocate the 3.5 GHz band currently used for the operation of satellite earth stations for mobile services developments. To ensure that satellite services operated by these satellite earth stations can coexist with future 5G services, the CA, based on technical considerations, has set up restriction zones in Tai Po and Stanley to constrain the deployment of mobile base stations operating in the 3.5 GHz band in the areas.