Review of Telecommunications Regulatory Framework

Consultation Paper

November 2018

Commerce and Economic Development Bureau

Review of
the Broadcasting Ordinance (Chapter 562) and the Telecommunications Ordinance (Chapter 106)

Phase Two

Review of the Telecommunications Regulatory Framework to Keep Pace with Advancement of Telecommunications Technologies

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ABOUT THIS CONSULTATION PAPER

1. This consultation paper is issued by the Communications and Creative Industries Branch of the Commerce and Economic Development Bureau (CEDB) to seek the views of members of the public, the telecommunications industry and other stakeholders on the CEDB's legislative amendment proposals following a review of the telecommunications regulatory framework under the Telecommunications Ordinance (Cap. 106) to keep pace with advancement of telecommunications technologies.

2. This consultation is Phase Two of the Government's legislative review of the broadcasting and telecommunications regulatory framework. This consultation paper consists of five chapters, focusing discussion on four improvement measures proposed under the review.

3. Consultation for Phase One of the review concerning broadcasting was completed in May 2018. The Government aims to introduce an amendment bill into the Legislative Council in 2019.

4. Please send your comments to us on issues covered in this consultation paper on or before **27 February 2019** by one of the following means:

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5. Electronic copy of this consultation paper is available on the website of the CEDB (http://www.cedb.gov.hk/ccib). All relevant Hong Kong ordinances are available for viewing and downloading on the websites of Hong Kong e-Legislation [1] maintained by the Department of Justice.

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[1] https://www.elegislation.gov.hk/

CONTENTS

List of Abbreviations

1G	First generation mobile communications
2G	Second generation mobile communications
3G	Third generation mobile communications
4G	Fourth generation mobile communications
5G	Fifth generation mobile communications
BO	Broadcasting Ordinance (Cap. 562)
CA	Communications Authority
CE	Chief Executive
CEDB	Commerce and Economic Development Bureau
CO	Competition Ordinance (Cap. 619)
EMSD	Electrical and Mechanical Services Department
FBOs	Facilities-based operators
HyD	Highways Department
ICNIRP	International Commission on Non-ionizing Radiation Protection
IDD	International direct dialling
IoT	Internet of Things
km^2	Square kilometre
LegCo	Legislative Council of the Hong Kong Special Administrative Region
ms	Millisecond
MVNO	Mobile virtual network operator
OFCA	Office of the Communications Authority
PRSL	Public Radio-communications Services Licence
SBOs	Services-based operators
SCED	Secretary for Commerce and Economic Development

TA	Telecommunications Authority
TCPAB	Telecommunications (Competition Provisions) Appeal Board
TDO	Trade Descriptions Ordinance (Cap. 362)
TO	Telecommunications Ordinance (Cap. 106)
UCL	Unified Carrier Licence
WIoT	Wireless Internet of Things
XP	Excavation Permit

Chapter 1

Background on the Review of the Broadcasting Ordinance and the Telecommunications Ordinance

Background

1.1 Broadcasting and telecommunications technologies have been developing in leaps and bounds. Our regulatory framework needs to be adaptive to change and be modernised from time to time to keep pace with the market environment to facilitate innovation, investment and consumer adoption.

1.2 The Government has been adopting a staged approach in reviewing the regulatory framework for broadcasting and telecommunications. The First Stage was completed in 2012 with the structural merger of the former Broadcasting Authority and the former Telecommunications Authority (TA) into the Communications Authority (CA) as the unified regulator of the two sectors pursuant to the enactment of the Communications Authority Ordinance (Cap. 616).

1.3 After the CA has been in operation for a few years and has accumulated some regulatory experience, the Government has proceeded to embark on the Second Stage of the exercise to review the Broadcasting Ordinance (Cap. 562) (BO) and Telecommunications Ordinance (Cap. 106) (TO) (the Review) with the objective of introducing appropriate changes to promote and facilitate the development of Hong Kong's broadcasting and telecommunications sectors.

Review of Broadcasting and Telecommunications Regulatory Framework

1.4 To facilitate focused discussions and to allow adequate time for stakeholders to reflect on the various policy issues and legislative proposals raised, the Government is carrying out the Review in two phases.

1.5 Phase One focuses on the regulation of broadcasting (both TV and sound) under the BO and Part 3A of the TO in response to the changes and challenges brought about by the evolution in the

infotainment industry. Phase Two focuses on the regulation of telecommunications under the TO in response to the advancement of telecommunications technologies, in particular the imminent arrival of the fifth generation mobile communications (5G) services and their application in the era of Internet of Things (IoT).

Phase One: Review of the Television and Sound Broadcasting Regulatory Framework

1.6 Phase One of the Review has looked into four aspects of the regulatory framework, *viz.*

(a) cross-media ownership restrictions;
(b) foreign control restrictions;
(c) requirement of a licensee being a non-subsidiary company; and
(d) licensing authority.

A number of legislative amendments have been proposed to remove obstacles for the traditional broadcasters and reducing the gap between them and the Internet media in terms of regulatory control.

1.7 Public consultation of the proposals put forward under Phase One of the Review was completed in May 2018. Stakeholders in general supported the direction of the proposals to relax obsolete statutory requirements and rationalise the regulatory arrangements. We aim to introduce an amendment bill into the Legislative Council (LegCo) in 2019. In parallel, other non-legislative measures, such as refinements to the relevant Codes of Practice, have been pursued to further facilitate the operation of traditional broadcasters.

Phase Two: Review of the Telecommunications Regulatory Framework

1.8 This paper provides the details of the proposals for Phase Two of the Review which focuses on the regulation of telecommunications. Telecommunications technologies have undergone revolutionary development in recent years and timely modernisation of the regulatory framework is required. The proposed new measures include:

Embracing the Arrival of 5G and IoT Technologies:

(a) regulation of telecommunications functions of devices in the 5G and IoT era;

(b) protection of underground telecommunications infrastructure;

Trade Facilitation:

(c) simplifying the issue of non-carrier licences; and

(d) improving the appeal mechanism under the TO.

1.9 After considering the views received from the public, industry and other stakeholders, we aim to introduce an amendment bill into LegCo in 2019.

Way Forward

1.10 We look forward to receiving your views. Your feedbacks would be most important for Hong Kong in maintaining a conducive environment for the continuous and sustainable development of our telecommunications industry.

Chapter 2

Phase Two: Review of Telecommunications Regulatory Framework

Background

2.1 Hong Kong has world-class telecommunications infrastructure and services. Modern and efficient telecommunications not only bring convenience to the general public, but have been a vital factor of Hong Kong's success as a leading business and financial centre. The Government is committed to putting in place an up-to-date, effective and pro-competition regulatory framework to facilitate innovation, investment and sustainable development of our telecommunications industry.

Overview of Hong Kong's Telecommunications Landscape

2.2 Our advanced telecommunications capability not only ensures the free flow of information that underpins our business activities but also improves the quality of people's lives with round the clock access to news, music, videos, social media, games and e-commerce. We are connected to one another and to the rest of the world. Access to goods, services, information and entertainment anytime anywhere in the globe has become a norm that has been taken for granted.

Evolution of Telecommunications Technologies

2.3 Telecommunications technologies have undergone transformative advancement in the past few decades and Hong Kong has been staying at the forefront of it. Telephone services have evolved from transmitting analogue voice calls to fixed locations, to ubiquitous mobile services nowadays capable of streaming quality audio and video signals. Dial-up phone-line-based internet access that mainly offered rudimentary text-based emailing service or simple web browsing has been replaced by high-speed broadband services that are capable of delivering 4K multimedia infotainment services real-time.

2.4 With a fully liberalised market in both local and external telecommunications, Hong Kong consumers are offered a wide assortment of services at affordable prices. With a responsive and adaptive telecommunications market, Hong Kong has been able to be a forerunner in the adoption of new telecommunications technologies.

The telecommunications regulatory framework in Hong Kong adopts a pro-competition, market-based approach to maximise efficiency.

Hong Kong's Telecommunications Services

2.5 Broadly speaking, public telecommunications services in Hong Kong are provided either by facilities-based operators (FBOs) or services-based operators (SBOs). The former are operators authorised to establish and maintain telecommunications networks and facilities for the provision of public telecommunications services, while the latter make use of the networks and facilities established by licensed FBOs to do so.

Facilities-based Telecommunications

2.6 Public telecommunications services provided by FBOs include local fixed services, external telecommunications services and mobile services.

Local Fixed Services

2.7 Local fixed services include fixed telephone, facsimile, broadband internet and public Wi-Fi services, etc. Since 2003, the local facilities-based market has been fully liberalised, with no pre-set limit on the number of licences to be issued or timing requirement for submitting applications. There is no specific requirement on the timing of network rollout or investment either. The level of investment is entirely determined by the market. With full competition, a number of FBOs have entered the market and brought down service charges. As of September 2018, there were 27 operators permitted to provide local fixed services.

2.8 A market-driven fixed telecommunications sector has created a vibrant market. The statistics below illustrate the high penetration rate and efficiency of Hong Kong's local fixed telecommunications services:

Table 1 : Telecommunications Services in Hong Kong (as of June 2018)

Indicators	Number / Percentage
No. of fixed lines per 100 residential households	90
Residential households having access to at least two (three) local fixed networks (as of March 2018)	89% (79%)
Registered residential and commercial fixed broadband customers	2.7 million
Broadband customers using service plans with speeds at 10 Mbps or above (up to 10 Gbps)	Over 83%
Residential households connected by optical fibres that enable high-speed broadband services	Over 73%
Public Wi-Fi hot spots	More than 54 270 (about 3 200 operated by the Government)
Average / average peak connection speed (as of 1st quarter of 2017)	4th in the world

The above numbers compare favourably with those of the most advanced economies in the world.

External Telecommunications Services

2.9 External facilities-based telecommunications services connect Hong Kong to the rest of the world. They include Internet connections as well as international direct dialling (IDD) services which are primarily supported by overland or submarine cables and satellites.

2.10 The external facilities-based telecommunications market has been fully liberalised since 2000. As of September 2018, there were a total of 41 cable-based operators and 39 satellite-based operators.

Mobile Services

2.11 Mobile services include mobile voice and mobile data services. Having been introduced into Hong Kong for more than three decades (since 1984 when the first public mobile radiotelephone service was introduced), mobile services have been advancing at an unprecedented pace, both in terms of service penetration and data speed. The following statistics provide a glimpse of the popularity of mobile services in Hong Kong:

Table 2 : Mobile Services in Hong Kong (as of March 2018)

Indicators	Number / Percentage
No. of mobile service subscribers	18.4 million (i.e. some 2.5 mobile subscriptions per citizen)
Mobile broadband customers subscribing to 2.5G, 3G or 4G mobile data services	17.2 million (more than 93% among all mobile subscribers)
Mobile data downlink speed	Up to 1.1 Gbps

2.12 Mobile telecommunications technologies have evolved from the first generation mobile communications (1G), based on analogue mobile radio systems, in the 1980s to the current 4th generation mobile communications (4G) capable of supporting high data-capacity services. 5G is expected to be deployed shortly in one or two years. This latest generation of mobile services will not only support much faster data transmission rate and transmission with ultra-low minimal latency, but will also be used to connect to a massive number of smart devices.

2.13 The market for mobile telecommunications services has been highly competitive since their introduction in the 1980s. With the introduction of mobile number portability since 1999, customers can retain their telephone numbers when switching to another mobile network operator. This has provided flexibility to customers in choosing their mobile networks and greatly widened their choice of operators.

Services-based Telecommunications

2.14 Unlike FBOs, SBOs are not authorised to establish or maintain any telecommunications facilities which cross unleased Government lands or public streets, and they have to make use of the networks and facilities of licensed FBOs for the provision of public telecommunications services. The types of services offered by licensed SBOs are similar to those offered by FBOs. Examples are external telecommunications services and mobile virtual network operator (MVNO) services.

2.15 External public telecommunications services operated by SBOs use external leased circuits to provide fixed services and to supply such circuits at the Hong Kong end.

2.16 MVNO service providers are authorised to provide mobile services to customers through interconnection with, and access to, the radio-communications infrastructure of an FBO without acquiring their own radio spectrum.

Overview of Telecommunications Licensing Framework

2.17 The wide range of telecommunications services in Hong Kong are regulated under the statutory licensing framework of the TO.

2.18 Telecommunications have been subject to Government regulation as early as in 1936 when the TO was first enacted, consolidating the then prevailing laws that regulated telegraphic messages and wireless telegraphy. Over the years, the scope of telecommunications systems and services regulated under the TO have been expanded and refined in tandem with technological advancement. The scope of regulation expanded from telegraphic messages and private telecommunications systems in the early days, gradually to fixed telecommunications network services and public mobile telephone services, and then to the latest wide range of services including mobile data and broadband services.

2.19 The following section briefly describes the various licences issued under the TO.

FBOs

Unified Carrier Licence (UCL)

2.20 FBOs establish their own telecommunications networks for provision of public telecommunications services. A "carrier licence" is defined under section 2 of the TO as –

> *"a licence issued for the establishment or maintenance of a telecommunications network for carrying communications to or from the public between fixed locations, between moving locations or between fixed locations and moving locations, within Hong Kong, or between Hong Kong and places outside Hong Kong, on a point-to-point, point-to-multipoint or broadcasting basis, such locations within Hong Kong being separated by unleased Government land, but does not include the licences listed in Schedule 1."*

2.21 Carrier licence was introduced in 2000. There were three major types of carrier licences, namely, fixed carrier licence, mobile carrier licence and space station carrier licence. In 2008, in response to the trend of convergence of fixed and mobile communications, a single licensing vehicle for both fixed and mobile telecommunications services, UCL, was introduced.

2.22 The licensing authority for UCLs is the CA[2], and the Secretary for Commerce and Economic Development (SCED) is the authority to prescribe by regulation the general conditions and licence fees[3]. The CA may impose special conditions for the issue of a UCL[4], in addition to the general conditions imposed by the SCED. The special conditions must be consistent with the TO and not inconsistent with the general conditions.

Non-carrier licences

2.23 Apart from UCLs, there are other kinds of licences for the establishment and maintenance of telecommunications network facilities.

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2 Section 7(5) of the TO.
3 Section 7(2) of the TO.
4 Section 7A of the TO.

Two such examples are the Public Radio-communications Services Licence (PRSL), which covers public radio paging services, trunked mobile radio service, public mobile data communications service, and the Wireless Internet of Things (WIoT) Licence, which is a recently created licence type for the establishment, maintenance and operation of wireless networks and systems for the provision of WIoT services.

2.24 PRSL and WIoT Licence, as well as other non-carrier licences, are issued by the CA, which is also empowered to determine the conditions and fees applicable to the licences.

SBOs

2.25 SBO Licences, as a type of non-carrier licences, are issued by the CA which has the authority to determine the general conditions, special conditions, and fees applicable to the licences.

2.26 Chapter 4 will provide a more detailed account of non-carrier licences and our proposed refinement of the mechanism for issuing them.

Other licences

2.27 Apart from the above-mentioned licences, some services are regulated under class licences which do not require any licence application. Parties meeting the eligibility criteria and conditions specified by the CA would automatically become class licensees, and are required to comply with the conditions set out in the relevant class licences as well as the TO for using their equipment or for providing telecommunications services regulated under the class licences. Class licensees include providers of public wireless local area network services (e.g. Wi-Fi services in coffee shops), and resellers of telecommunications services (e.g. providers of IDD calling cards), users and traders of 60 GHz radio-communications apparatus, etc. The CA has also issued private licences for communication within a closed user group[5].

[5] Closed user group means a group of persons, businesses or companies engaged in a common business or activity for which the group is formed for the specific purpose of furthering such business or activity. For example, the Private Mobile Radio System Licence issued to transportation companies, property management companies, construction companies and engineering consultant firms authorising them to possess, establish, maintain and use their own radio-communications systems.

Need for Review

Advent of New Telecommunications Technologies

2.28 The Government conducts reviews from time to time to update our policy and legislation. Over the years, a number of legislative amendments have been made to the TO and related regulations, the most significant ones being those introduced during the period of liberalisation of the local and external telecommunications markets in the late 1990s/early 2000s. New licence types have emerged to keep pace with market development to meet the changing needs of operators and the public. Codes of practice are refined and new ones are introduced to stipulate the operational details for reference of and compliance by the telecommunications operators.

2.29 The next big wave of telecommunications development is the arrival of 5G which empowers massive adoption of IoT and smart communications platforms. These new technologies will create a world of connected devices: very soon not only computers, smartphones and tablets but also household appliances, medical equipment, cars or even pets – virtually everything in our daily life – can "talk to one another". We need to ensure that our regulatory framework is 5G-ready.

2.30 The Government would also take this opportunity to fine-tune certain statutory provisions and introduce measures to facilitate the operation of the industry. As a promoter and facilitator, the Government is always mindful of the need to maintain a conducive business environment. We have also received feedback and comments from the operators and stakeholders on various improvement aspects.

2.31 Chapter 3 and Chapter 4 outline our proposals in four major areas.

Chapter 3

Embracing the Arrival of 5G and IoT Technologies

3.1 As the Chief Executive (CE) has mentioned in her 2018 Policy Address, the advent of 5G presents new opportunities and challenges. It will not only upgrade telecommunications, innovation and technology infrastructure, but also open up high value-added markets and industries, boost efficiency and competitiveness and revolutionise mobile user experience, bringing vast potential for various commercial services and smart city applications.

3.2 The CA has been allocating adequate spectrum in advance to support 5G development and will make available a total of 4 500 MHz of new spectrum in 2019/2020 for the provision of 5G services, which amounts to eight times the existing 552 MHz of spectrum assigned for the provision of public mobile services. With such a significant amount of spectrum to support the development of 5G services, Hong Kong will be well-placed to launch the new generation of telecommunications services.

3.3 The arrival of 5G technology would enable the development and massive adoption of IoT devices. Our future will be moving from a network of dedicated telecommunications equipment and devices (e.g. land-line telephones, fax machines, mobile handsets) in the pre-5G era, to a ubiquitously networked environment – everything in our daily life, from small wearable gadgets (e.g. wrist watches and goggles) to large home apparatus (e.g. refrigerators) and vehicles can potentially be equipped with telecommunications functions. They can be connected to and communicate with one another to form a network of things. While the boundary defining the concept of "telecommunications equipment" is blurring, there is a need to regulate the telecommunications functions of this generation of smart devices.

3.4 With a surge in the number of devices connected to telecommunications networks which support more sophisticated, innovative and mission critical applications, the protection of the underlying infrastructure that underpins such communications has become all the more important. Any breakdown would not only result in suspension of basic telecommunications services, but also malfunctioning of applications and smart gadgets connected to the networks. This may cause serious distress to our daily life, severe

disruption to business activities and significant economic loss.

3.5 We propose to introduce two forward-looking measures to embrace the arrival of the 5G and IoT technologies and advancement of telecommunications technologies, *viz.*: –

(a) regulation of telecommunications functions of devices in the 5G and IoT era; and
(b) protection of underground telecommunications infrastructure.

A. REGULATION OF TELECOMMUNICATIONS FUNCTIONS OF DEVICES IN THE 5G AND IOT ERA

Background

3.6 The CA and its executive agency, the Office of the Communications Authority (OFCA), have been regulating the telecommunications functions of various telecommunications equipment being used in Hong Kong. Examples of the telecommunications equipment currently regulated includes mobile phones, radio base stations, fixed line telephones, cordless telephones, Wi-Fi equipment, as well as other advanced telecommunications installations.

3.7 To protect the integrity of and ensure compatibility with the telecommunications networks, a set of telecommunications technical standards are stipulated to regulate facilities, equipment, devices and terminals connected to the networks. In 2000, Part 5A of the TO was enacted to, inter alia, empower the former TA to set technical standards and to conduct certification of telecommunications equipment. Upon establishment of the CA in 2012, the power has been transferred to the CA.

3.8 In addition, the level of non-ionising electromagnetic radiation emitted by telecommunications equipment is also regulated. The CA prescribes appropriate standards and requirements to ensure, among other things, that non-ionising electromagnetic radiation from

telecommunications apparatus is within an acceptable safety level[6]. Under Part 5A of the TO, there are also provisions for regulating the safety aspects of electrical voltages of customer telecommunications equipment.

CA's Power to Prescribe Technical Standards and Specifications

Statutory Power

3.9 Section 32D of Part 5A of the TO provides that the CA may prescribe standards and specifications of the following –

(a) telecommunications networks, systems, installations, customer equipment and services (examples include mobile phones, radio repeater and base stations, etc.);

(b) other non-telecommunications equipment generating radio frequency energy that may cause interference to telecommunications networks, systems, installations, customer equipment and services, whether deliberately or incidentally (examples include industrial, scientific and medical equipment including medical diathermy and magnetic resonance equipment, etc.); and

(c) other non-telecommunications equipment that may suffer interference from telecommunications networks, systems, installations, customer equipment and services.

3.10 The same section provides that such standards and specifications have to be prescribed in pursuit of the following objectives –

(a) to prevent or reduce radio interference or the risk of interference to telecommunications networks, systems, installations, customer equipment and services;

(b) to facilitate correct, efficient or reliable operation of

[6] In consultation with the Department of Health, the CA has adopted the emission limits as recommended by the International Commission on Non-ionizing Radiation Protection (ICNIRP) as the standard for non-ionising electromagnetic radiation. The ICNIRP limits are recognised by the World Health Organization as the related standard.

telecommunications;

(c) to ensure safety and health of users and personnel affected by electrical voltages or non-ionising electromagnetic radiation from telecommunications apparatus;

(d) to ensure that equipment complies with international or recognised industrial standards;

(e) to ensure the compatibility of the interfacing equipment between two or more interconnecting telecommunications networks, systems, installations, customer equipment or services;

(f) to ensure the interoperability of customer equipment with the telecommunications system to which it is connected;

(g) to ensure an acceptable quality of reception of telecommunications services; or

(h) as a means to achieve the objectives of the TO.

3.11 In exercise of the above power, the former TA and the CA prescribed a total of 113 specifications[7] as at October 2018. These specifications cover a wide range of telecommunications equipment, including, among others, 2G/3G/4G mobile phones, Wi-Fi access points, radio frequency identification devices, cordless telephones and payphones.

The Arrival of 5G and Proliferation of Smart Devices

3.12 As mentioned in Chapter 2, 5G is the upcoming generation of telecommunications technology which has the following key features –

(a) Faster data transmission rate: The data transmission rate of 5G is expected to be up to 10-20 Gbps, which is around 20 times of 4G. As an example, while it takes about six minutes to download a two-hour-long high

[7] The list of HKCA specifications prescribed under section 32D of the Telecommunications Ordinance is published at: https://www.ofca.gov.hk/en/industry_focus/telecommunications/standards/hkca/index.html.

resolution movie (4.8 Gigabytes in file size) using 4G technology, 5G needs only 20 seconds.

(b) Much lower latency: Latency refers to the time it takes for the network to respond to a request. 5G is featured to be of ultra-low latency, *viz.* 1 millisecond (ms) as compared to 10 to 50 ms in 4G. Such ultra-low latency enables innovative 5G applications that demands real-time, immediate response (e.g. autonomous vehicles).

(c) High Connection density: 5G technology enables a lot more devices to be connected to the network at the same time. Roughly speaking, 5G is expected to support up to one million connected devices per square kilometre (km^2). This makes it possible for the massive application of IoT in densely populated areas (e.g. a high-speed area network on a school campus).

Need for Review

3.13 In a new era that everything can be connected, the traditional classification of "telecommunications equipment" that was applicable to standalone terminals the primary functions of which are to connect to the networks for communication would no longer be appropriate. For the new generation of smart devices, network connectivity will become an ancillary feature, if not a standard function, of most digital products. Many consumer or household products that are not primarily designed or used for telecommunications purposes could be equipped with communications modules.

3.14 The proliferation of these smart devices brings new challenges and gives rise to the question of whether all of them should be treated as telecommunications equipment for the purpose of regulation under the TO and how they should be regulated.

Proposal

3.15 We have conducted a review and considered that the telecommunications functions of IoT devices should be regulated under the TO. These functions are related to the integrity of and their compatibility with the telecommunications networks and level of non-ionising electromagnetic radiation.

3.16 Even though communication may not be the primary purpose of these IoT devices, the telecommunications chips or modules embedded therein are performing the same telecommunications functions as other "traditional" telecommunications equipment. These functions should be regulated under the TO in the same manner as those traditional equipment.

3.17 We propose that the non-telecommunications functions of these smart and IoT devices should continue to be regulated by the respective general or dedicated legislation as applicable to them. We will introduce necessary legislative amendments to empower the CA to focus on the regulation of the telecommunications functions of such products, and to ensure that other non-telecommunications functions and aspects (e.g. electrical and other general safety aspects) will be covered by other relevant ordinances.

3.18 The CA will be empowered to prescribe standards and specifications for the telecommunications functions of such equipment, goods and products, including embedded modules used for communications, similar to the arrangement described in paragraph 3.9 and 3.10 above. The objectives are to prevent or reduce the risk of harmful radio interference; facilitate effective operation of telecommunications; control the level of non-ionising electromagnetic radiation; ensure compliance of equipment with international or recognised industrial standards; and ensure the compatibility and interoperability of the interconnecting equipment.

B. PROTECTION OF UNDERGROUND TELECOMMUNICATIONS INFRASTRUCTURE

Background

3.19 In Hong Kong, underground spaces, especially those in urban areas, are packed with various important facilities. Among these underground facilities are telecommunications ducts and lines including copper wires and optical fibres, etc. that provide territory-wide coverage of telecommunications services.

3.20 Telecommunications networks and services underpin the operation of an information society. As millions of telephone calls and terabytes of data could be carried over a single optical fibre cable, the potential disruption to the general public caused by accidental damage to underground telecommunications infrastructure could be very serious. With the imminent arrival of 5G services and more extensive use of smart city applications, the integrity of our telecommunications infrastructure would become even more crucial. Any extensive or prolonged breakdown would not only result in suspension of telecommunications services, but would also trigger a chain reaction that could bring our city to a complete stop.

Existing Protection of Underground Telecommunications Infrastructure

3.21 At present, there are a number of legislative provisions which provide various degree of protection of underground telecommunications infrastructure.

3.22 The Land (Miscellaneous Provisions) Ordinance (Cap. 28) requires the responsible party to obtain an Excavation Permit (XP) from the Highways Department (HyD) or Lands Department for conducting any excavation works in unleased Government land. Specific requirements are included in the XP conditions to mandate the permit holders to take appropriate precautionary measures to prevent damage to

existing underground facilities, including telecommunications cables[8]. Violation of an XP condition is a criminal offence and shall be liable on conviction to a fine at level 5, i.e. $50,000.

3.23 Protection of telecommunications infrastructure is also provided for in section 18 of the TO. Any person who proposes to carry out work that may affect a telecommunications line or radio-communications installation shall take all reasonable precautions to prevent damage to such facilities. An affected licensee may instigate civil proceedings against the person to recover any expenses incurred in making good the damage caused. In more serious cases, anyone who damages, removes or interferes with a telecommunications installation with intent may be guilty of a criminal offence under section 27 of the TO and liable on conviction to a fine and imprisonment.

3.24 In addition, section 14 of the TO requires telecommunications licensees who wish to place and maintain underground telecommunications facilities in unleased Government land to obtain the CA's authorisation and Lands Department's written consent, as well as apply for other permits to commence the excavation works for installation or maintenance of such facilities. Licensees are in general required to coordinate among themselves[9] and agree on the shared use of facilities as far as possible, with the objective of avoiding the frequent need of excavation works.

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[8] For excavation works carried out on streets, examples of such measures include making all reasonable efforts to obtain relevant utility record plans from utility companies; using suitable non-destructive underground services detectors to locate existing underground services before excavation; using hand-digging method for excavation close to or around existing underground services; and taking all reasonable precautions to protect the existing underground services in the vicinity from the effects of vibration, undermining, or other earth movements caused by the works of permit holders, etc.

[9] Special Condition 16.1 of a Unified Carrier Licence provides that "the licensee shall co-ordinate and co-operate with any other unified carrier licensee or fixed carrier licensee under [the TO] and any other authorised person in respect of road openings and shall, after being consulted by [the CA], comply with any guidelines issued by [the CA]."

Review: Higher Deterrence Needed

3.25 Notwithstanding the above safeguards, the existing system has its limits. Section 18 of the TO is confined to civil claims only (a licensee may recover from the person any expenses incurred by the licensee in making good any damage to a telecommunications line or radio-communications installation caused by that person's failure to take all such reasonable precautions in the carrying out of work). There is no provision under the TO which could be relied upon by the CA or the Government to take punitive action against any third parties negligently causing damage to the telecommunications infrastructure.

3.26 Even if a network operator succeeds in making a civil claim, the compensation will likely cover the expenses incurred by the licensee in making good the damaged telecommunications facility only, but will not impose any penalty on the person who committed the wrongful act that caused telecommunications network outage and interruption. If a specific offence against negligent damage to underground telecommunications facilities is introduced, it would provide stronger deterrence and better protection for both telecommunications operators and the public from network outage.

3.27 From time to time, there have been cases of damage to underground telecommunications networks, resulting in accidental suspension of telecommunications services. Below are two examples:

Example 1:

On 2 February 2018, a total of five sections of underground optical fibre cables were damaged by a third-party contractor during its construction works in the vicinity of a construction site in Shatin, resulting in service disruptions to fixed broadband services, data services and mobile services provided by several telecommunications operators in Shatin, Ma On Shan and Tai Po for 12 hours. The incident affected about 2 000 fixed broadband service customers.

Example 2:

On 13 April 2012, three optical fibre cables were damaged in Causeway Bay, causing disruptions to the commercial and residential broadband Internet access services (including Internet Protocol telephony services and broadband television broadcasting services) of telecommunications operators concerned. The incident affected about 4 000 residential broadband service customers in the New Territories West region, as well as about 13 500 commercial broadband service customers and about 150 broadband television broadcasting service customers in various districts. The incident was caused by a third-party contractor during its excavation works for a construction project.

3.28 Over the years, there have been strong voices from network operators calling for enhanced protection of underground telecommunications infrastructure. They consider that the existing safeguards under the TO are inadequate. Other underground infrastructures such as electricity supply lines and gas pipes are protected both by XP conditions and sanctions under legislative provisions. Operators consider that the TO should introduce criminal liabilities on the part of a party causing damage to underground telecommunications line.

Proposal

3.29 We propose to put in place in the TO new criminal liabilities deterring negligent damage to underground telecommunications facilities. The proposed offences draw reference from other existing statutory protection of public infrastructures, including electricity supply lines and gas pipes. Details of these other existing statutory protection are set out below.

Electricity Supply Lines (Protection) Regulation (Cap. 406H)

Section 10 of the Electricity Supply Lines (Protection) Regulation provides that a person shall take all reasonable steps to ascertain the existence and alignment and depth of any underground electricity supply lines at or in the vicinity of the works before the works begin, and shall take all reasonable measures to prevent an electrical accident or interruption to the electricity supply arising from those works. Contravention is an offence and the offender is liable to a fine and/or imprisonment, with differing severity depending on whether an electrical accident or interruption has actually happened.

2. As the enforcement agent of the offence, the Electrical and Mechanical Services Department (EMSD) issued the Code of Practice on Working near Electricity Supply Lines that outlines the risks and provides practical safety guidelines to parties concerned, including on-site workers, electricity supplies and cable detection person, etc. to reduce the risk arising from damage to underground electricity supply lines.

3. In gist, the Code provides that during the pre-works stage, the working party shall approach electricity suppliers for cable plans and other related information. The working party should, however, not rely entirely on such information, and shall appoint a competent person approved by the Director of Electrical and Mechanical Services to carry out further detection work using more accurate means such as passive detection and trial hole excavation, etc. to identify the most probable alignment of the underground power supply lines.

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1. Contravention by failing to undertake pre-works precautionary measures is liable to a fine at level 4 (i.e. $25,000) and imprisonment for 6 months. For failure to undertake precautionary measures during the works, contravention that results in an electrical accident or interruption of electricity supply shall be liable to a fine of $200,000 and imprisonment for 12 months, and otherwise to a fine at level 4 and imprisonment for 6 months.

Gas Safety (Gas Supply) Regulations (Cap. 51B)

4. Regulation 23A of the Gas Safety (Gas Supply) Regulations provides that a person shall take all reasonable steps and measures to ascertain the location and position of gas pipes before commencing the works in vicinity of a gas pipe, and to protect the gas pipes from damage arising out of the works that would be likely to prejudice safety. Violation of the requirement is an offence liable for a fine and/or imprisonment.

5. The EMSD is the enforcement agent of the Gas Safety (Gas Supply) Regulations. A "Code of Practice – Avoiding Danger from Gas Pipes" was issued by the EMSD in July 1997 to indicate the potential dangers arising from damage to gas pipes near the works and to give advice on precautionary measures to reduce the risk. The precautionary measures are similar to that for electricity supply lines, requiring the employment of safe systems of work which comprise four basic elements, *viz.*

(a) **Plans**. Persons undertaking the works shall obtain from the gas supply companies plans indicating the positions of the gas pipes;

(b) **Pipe locating devices**. Suitable pipe locating devices, e.g. locators of radio frequency detection or transmitter/receiver type, shall be employed to locate as accurately as possible the position of the underground gas pipes, in conjunction with the available plans obtained;

(c) **Trial holes**. The position of gas pipes identified shall be confirmed by digging trial holes using hand tools; and

(d) **Safe excavation practices**. Appropriate safe digging and backfilling practices should be employed during the works stage.

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1. Contravention by failing to undertake pre-works precautionary measures (i.e. contravention of Reg. 23A(1), Cap. 51B) is liable to a fine at level 4 and imprisonment for 6 months. Contravention by failing to undertake precautionary measures during the works (i.e. contravention of Reg. 23A(2), Cap. 51B) shall be liable to a fine of $200,000 and imprisonment for 12 months, and in the case of a continuing offence, to a further daily penalty of $10,000.

3.30 We propose that anyone failing to undertake pre-works precautionary measures, which include identifying and locating details of the underground telecommunications lines (e.g. alignment and depth), or failing to undertake measures during the road works to prevent damage to underground telecommunications lines, should be liable to a fine at level 4 (i.e. $25,000) and imprisonment for 6 months. In addition, if the failure to undertake precautionary measures during the road works results in suspension of telecommunications services, the offender shall be liable to a fine of $200,000 and imprisonment for 12 months. In the case of a continuing offence, an additional fine of $10,000 per day shall also apply.

3.31 The CA will act as the enforcement agent of the proposed provisions. To facilitate compliance with the relevant requirements by works agents, the CA will promulgate and approve, in consultation with the industry, relevant codes of practice. Similar to the arrangements for electricity supply lines and gas pipes, such codes will provide guidance on what would constitute reasonable steps and measures. It is proposed that compliance with the codes of practice would be a defence to a charge under the proposed offences.

Chapter 4

Trade Facilitation

4.1 As a consequence of the nature and ubiquity of 5G network technologies, numerous new services of different scope or geographical coverage would become available. We need a responsive and flexible licensing framework to regulate these services. As facilitator to promote development of the industry, the Government strives to improve the regulatory framework to lower the operating and compliance cost and to create a conducive business environment. We propose to implement the following two specific measures:

(a) simplifying the issue of non-carrier licences; and
(b) improving the appeal mechanism under the TO.

A. SIMPLIFYING THE ISSUE OF NON-CARRIER LICENCES

Background

Non-Carrier Licences

4.2 As explained in Chapter 2, carrier licences are issued for the establishment or maintenance of telecommunications networks for carrying communications to or from various locations of the territory, including such locations within Hong Kong being separated by unleased Government land, for the provision of public telecommunications services. Section 7 of the TO provides that carrier licences (other than exclusive licences) are issued by the CA, with the general conditions that are applicable to all carrier licensees prescribed by the SCED by regulations. The CA may, if necessary, prescribe specific conditions applicable to individual carrier licensees in granting the licences. Carrier licences are designed to regulate large-scale, territory-wide telecommunications operations and services. As such, the control and regulation of carrier licences are more stringent than non-carrier licences and charge higher licence fees because of the higher level of administrative costs involved.

4.3 Certain facilities-based services, however, are caught by the generic and broad definition of "carrier licence" under the TO since they share some characteristics of a carrier licence. These facilities-based services are generally of a more limited scope with a smaller scale of operation. It is more appropriate to apply a less stringent set of conditions as compared to those applicable to carrier licences.

4.4 The TO provides that the SCED may exclude certain licences that may otherwise fall within the definition of carrier licence from being caught by such definition by including them in Schedule 1 to the TO[10]. Such licences could hence be issued as "non-carrier licences", subject to less stringent regulatory control, and with the form of licence, licence conditions, validity period and fees payable to be determined by the CA. This provides more flexibility in applying the most appropriate licensing control to a telecommunications service to suit its nature.

4.5 In determining whether a licence should be classified as a non-carrier licence, the following factors will be taken into account –

(a) whether the services concerned have the full attributes of carrier licence services;

(b) whether it is suitable to impose the same level of stringent regulatory control applicable to carrier licence given the nature and operational characteristics of the services concerned; and

(c) whether charging the existing level of fees applicable to carrier licences is proportionate given the nature and scale of the services concerned, and whether a lower fee level would be justified from the policy objective of promoting the development of innovative services in Hong Kong and full recovery of administrative costs involved in regulation.

The CA will consult the industry as necessary on its licensing proposal before non-carrier licences are created to ensure that the proposal meets the needs of the sector.

[10] Section 7(4) of the TO.

Review: Need for Expeditious Issue of Licence in 5G and IoT Era

4.6 To facilitate the trade to introduce innovative services quickly in the 5G era, we need a more flexible licensing framework that can respond expeditiously to technological advancement and market conditions. We envisage that 5G would be deployed in providing commercial services in more localised, area-specific settings and numerous new applications would be available for different business sectors.

4.7 We have reviewed the existing modus operandi for the issue of non-carrier licences under the TO. In conducting our review, we have made reference to the arrangements for the issue of licences that do not have the characteristics of carrier licences under the TO. Under section 7(5) of the TO, the CA may issue such licences directly without amendments to any Schedules. The CA has been prudently exercising such power over the years to create suitable types of non-exclusive licences, such as public radio-communications service licences and services-based operator licences, which facilitate development of the telecommunications service market. Making reference to such mechanism, there is room to streamline the arrangement for creation of non-carrier licences.

Proposal

4.8 In view of the more limited scope and nature of services provided and smaller scale of operation of holders of non-carrier licences, we propose to streamline the existing mechanism for issuing non-carrier licences for facilities-based telecommunications services. Instead of requiring the SCED to specify these non-carrier licences under Schedule 1 to the TO, we propose that the SCED may by notice published in the Gazette (which is not subsidiary legislation) specify non-carrier licences which will be issued by the CA. These non-carrier licences would be subject to a set of less stringent conditions to be determined by the CA as compared to those applicable to carrier licences.

4.9 The new mechanism will not involve subsidiary legislation amendment procedures and will be conducive to the rapid development of the telecommunications industry in embracing new technologies and new applications. For example, local telecommunications operators may launch innovative neighbourhood 5G network services covering selected regions or districts instead of on a territory-wide basis. New services may also emerge from time to time for sector specific applications (e.g.

property management, parking/access control, automation in manufacturing, transportation, academic research, health care, etc.). In these cases, the SCED may expeditiously, by notice published in the Gazette, specify the specific type of non-carrier licence which the CA may issue under the TO.

B. IMPROVING THE APPEAL MECHANISM UNDER THE TELECOMMUNICATIONS ORDINANCE

Background

Evolution of the Appeal Mechanism under the TO

4.10 The appeal mechanism under the TO has been evolving to meet the ever-changing regulatory needs of the telecommunications market and technological landscape.

4.11 An appeal mechanism relating to competition matters under the Telecommunications (Competition Provisions) Appeal Board (TCPAB) was first established in the early 2000s and has been refined thereafter. By way of background, during two rounds of public consultation in 1998, the telecommunications industry and stakeholders supported that competition-related provisions should be introduced under the TO for the former TA to apply competition safeguards over the whole industry. The relevant competition provisions were then proposed to be introduced to the TO through the Telecommunications (Amendment) Bill 1999. During the deliberation of the relevant Bill at LegCo, it was proposed that an appeal mechanism should be established to allow parties who are aggrieved by the former TA's decision in relation to the competition matters to apply for a review of the former TA's decision on merits. The TCPAB was accordingly established under the then TO in 2001.

4.12 The former TA was empowered, with the assistance of the former Office of the Telecommunications Authority, to investigate cases involving anti-competitive practices, abusing dominant position, discriminatory practices, as well as misleading or deceptive conduct of telecommunications licensees.

4.13 Before 2003, the regulation of mergers and acquisitions of licensees in the telecommunications market was performed by the former TA through licence conditions. It was considered that the regulatory

frameworks on mergers and acquisitions on the telecommunications market should be strengthened through introducing additional competition-related provisions in the TO. The objective was to give the former TA an effective regulatory tool to intervene where there was regulatory concern that a merger and acquisition might substantially lessen competition in the telecommunications market. The scope of the TCPAB was further enhanced in 2003 to cover mergers and acquisitions in the telecommunications market.

4.14 Upon the commencement of the amended Trade Descriptions Ordinance (Cap. 362) (TDO) and the Competition Ordinance (Cap. 619) (CO) in 2013 and 2015 respectively, the sector-specific fair trading and competition provisions in the telecommunications sectors set out in the TO were repealed, with the CA conferred with concurrent jurisdiction with the Customs and Excise Department and the Competition Commission respectively to enforce relevant provisions in the telecommunications and broadcasting sectors.

4.15 The scope of the TCPAB has then been updated correspondingly. The TCPAB currently deals with matters under section 7Q of the TO only. Section 7Q of the TO provides that a licensee in a dominant position in a telecommunications market must not engage in conduct that in the opinion of the CA is exploitative. A licensee aggrieved by the CA's decision under this section might lodge an appeal to the TCPAB. Other than this, a licensee who wants to challenge a decision of the CA can only seek a judicial review.

Need for Review

4.16 The appeal mechanism concerning competition matters in the telecommunications sector has been in place for over 15 years and has been operating well. Since the establishment of the TCPAB in 2001, the board has handled a total of 31 cases, mainly on competition-related matters.

4.17 In today's increasingly complex, vibrant and fast-developing telecommunications market, telecommunications operators would expect more cost-effective and efficient means to redress their grievances against certain non-competition related regulatory decisions. It is an appropriate juncture to review the existing appeal functions under the TO.

Proposal

4.18 We have reviewed the provisions under the TO which involve the CA's decisions. We propose to provide an appeal avenue under the TO covering the following decisions made by the CA:

(a) refusal to grant telecommunications licence (section 7 of the TO);
(b) refusal to give consent on tariffs (section 7F of the TO);
(c) revocation of certificate of competency and authority to operate for operating personnel (section 32K of the TO);
(d) cancellation, withdrawal or suspension of licence, permit, permission or consent granted (section 34(4) of the TO);
(e) determination of terms and conditions of interconnection (section 36A of the TO);
(f) direction on sharing of use of facilities (section 36AA of the TO);
(g) directions by the CA (on provisions subject to appeal) (section 36B of the TO); and
(h) imposition of financial penalties (section 36C of the TO).

4.19 The aforementioned decisions are likely to affect the telecommunication licensees' civil rights and obligations that have a bearing on their businesses and operations. The new appeal mechanism will provide an effective avenue for the licensees who are aggrieved by the CA's decisions to apply for a statutory review of such decisions.

4.20 We propose to set up an independent appeal board similar to the TCPAB to handle cases involving decisions mentioned in paragraph 4.18 above. By making reference to the existing TCPAB, it is proposed that only persons who are eligible to be appointed as a judge of the High Court under section 9 of the High Court Ordinance (Cap. 4) shall be appointed as the chairman or deputy chairman of the proposed appeal board. Persons not being public officers with relevant experience and expertise shall be appointed as members of the proposed appeal board. The authority to appoint chairman, deputy chairman and members of the proposed appeal board rests with the CE.

4.21 When hearing an appeal, the proposed appeal board shall consist of a chairman or a deputy chairman who shall preside at the hearing and two panel members appointed by the chairman or deputy chairman. Every question before the proposed appeal board shall be determined by the opinion of the majority of the members hearing the appeal except a

question of law which shall be determined by the chairman or deputy chairman. In the case of an equality of votes, the chairman or deputy chairman shall have a casting vote. After the hearing, the proposed appeal board shall determine the appeal by upholding, varying or quashing the appeal subject matter and may make such consequential orders as may be necessary.

Chapter 5

Summary of Recommendations

5.1 A list of our legislative amendment proposals are set out below as aide-memoire:

<u>Embracing the Arrival of 5G and IoT Technologies</u>

(a) Regulation of Telecommunications Functions of Devices in the 5G and IoT Era

- to focus the CA's regulatory powers and duties on the telecommunications functions (i.e. integrity of and compatibility with telecommunications networks and control of the level of non-ionising electromagnetic radiation) of telecommunications equipment and 5G and IoT devices in the 5G and IoT era; and

- the non-telecommunications functions of such equipment and devices should be regulated by their respective dedicated legislation as appropriate.

(b) Protection of Underground Telecommunications Infrastructure

To create certain criminal offences under the TO against any person, who without taking reasonable care in carrying out road works, causes damage to underground telecommunications facilities as follows:

- anyone failing to undertake pre-works precautionary measures or measures during the road works to prevent damage to underground telecommunications line should be liable to a fine at level 4 (i.e. $25,000) and imprisonment for 6 months;

- where the failure results in suspension of telecommunications services, a more severe

punishment will apply, *viz.* a fine of $200,000 and imprisonment for 12 months;

- in the case of a continuing offence, an additional fine of $10,000 per day shall also apply; and

- compliance with relevant codes of practice or guidelines promulgated by the CA shall constitute a defence to a charge under the above proposed offences.

Trade Facilitation

(c) Simplifying the Issue of Non-carrier Licences

To simplify the existing mechanism of excluding licences having the characteristics of carrier licences from the scope of carrier licence under the TO by empowering the SCED to publish such licenses in the Gazette instead of by specifying them in Schedule 1 to the TO.

(d) Improving the Appeal Mechanism under the TO

To improve the appeal functions under the TO by establishing an independent appeal board to deal with the following decisions of the CA:

(i) refusal to grant telecommunications licence (section 7 of the TO);
(ii) refusal to give consent on tariffs (section 7F of the TO);
(iii) revocation of certificate of competency and authority to operate for operating personnel (section 32K of the TO);
(iv) cancellation, withdrawal or suspension of licence, permit, permission or consent granted (section 34(4) of the TO);
(v) determination of terms and conditions of interconnection (section 36A of the TO);
(vi) direction on sharing of use of facilities (section 36AA of the TO);
(vii) directions by the CA (on provisions subject to

appeal) (section 36B of the TO); and

(viii) imposition of financial penalties (section 36C of the TO).

An independent appeal board will be set up to handle cases involving decisions mentioned above. Reference will be made to the existing Telecommunications (Competition Provisions) Appeal Board in mapping out the composition and modus operandi of the proposed appeal board.

5.2 Subject to the outcome of this consultation, we would put forward an amendment bill to LegCo to implement these proposals within 2019.

~ The End ~

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