

Telecommunications Regulatory Affairs Advisory Committee

**Proposed Creation of a New Licence for the Provision of
Wireless Internet of Things Services**

PURPOSE

This paper briefs Members on the proposed creation of a new “Public Wireless Internet of Things Service Licence” (“WIoT Licence”) for the establishment, maintenance and operation of wireless networks and systems for the provision of wireless Internet of Things (“IoT”) services with the use of radiocommunications equipment operating in the 920 – 925 MHz band.

BACKGROUND

2. IoT is an emerging technology which enables the provision of communications platforms and services for interconnected devices to generate, exchange and consume data with minimal human intervention. The emergence of new generations of wireless and mobile technologies is enabling the mass implementation of IoT. There are forecasts that the number of IoT devices will grow exponentially and the world will have tens of billions connected devices by 2020.

3. The Office of the Communications Authority (“OFCA”) has recently received licence applications from parties which would like to establish, maintain and operate wireless networks and systems for the provision of wireless IoT services in Hong Kong based on Low Power Wide Area Network (“LPWAN”) technologies operating in the 920 – 925 MHz band. At present, the use of frequency spectrum in the 920 – 925 MHz band by any person in respect of any radiocommunications apparatus in Hong Kong is exempted from licensing, pursuant to the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106Z) (“Exemption Order”), on the conditions, among others, that the

apparatus shall meet the technical criteria set out in Schedule 2 of the Exemption Order and that the person shall not use the apparatus to provide a public telecommunications service. Existing uses of the frequency spectrum include radio frequency identification (“RFID”) equipment and devices. That notwithstanding, as the parties making licence applications to OFCA intend to establish a territory-wide network with the use of the aforementioned frequency band to offer in the course of business a public telecommunications service, an appropriate licence to be issued pursuant to section 8(1) of the Telecommunications Ordinance (Cap. 106) (“TO”) is therefore required.

4. In light of the applications received to provide wireless IoT services based on LPWAN technologies operating in the 920 – 925 MHz band and in order to facilitate its development, there is a need for OFCA to review and update the existing licensing regime to facilitate the launch of such new public telecommunications services in Hong Kong.

CREATION OF A NEW LICENCE

5. In considering the licensing regime for wireless IoT services based on LPWAN technologies, it is observed that the characteristics of such services are distinct from those of full-fledged public mobile services as explained below –

- (a) Wireless IoT services based on LPWAN technologies would make use of the 920 – 925 MHz band on a shared basis, and co-exist with other licence exempted devices without protection and coordination;
- (b) The concerned wireless IoT devices are in general sensors, cameras, vehicles, appliances etc., without the full-fledged functionality of typical mobile handsets or terminals;
- (c) The concerned wireless IoT services primarily involve automated operation with little or no human intervention;

- (d) The concerned wireless IoT services typically support scheduled data collection but not real-time interactive voice communications; and
- (e) No telecommunications number would be needed.

6. At present, any party establishing a territory-wide wireline or wireless network which may cross unleased Government land or public streets for the provision of public telecommunications services should be licensed as a facility-based operator (“FBO”). In general, the operation of a FBO should be licensed under the Unified Carrier Licence (“UCL”) or the Public Radiocommunications Service Licence (“PRSL”). The UCL is a single licensing vehicle for carrier-grade facility-based telecommunications services and has been implemented since August 2008 which authorises the licensee to provide a full-fledged fixed, mobile and/or converged services. The PRSL is a legacy licensing regime adopted since the 1990s for the licensing of public radiocommunications services. Historically, mobile services were originally licensed under the PRSL regime but had subsequently been replaced by the carrier licensing regime since 2001. Nowadays, public radiocommunications services authorised under PRSL only include radio paging, vehicle location information services¹, trunked mobile radio services, one-way data message services² and public mobile radio data services.

7. Although the wireless network operated by a party providing wireless IoT services based on LPWAN technologies may cross unleased Government land or public streets, it is noted that neither of the two above-mentioned licences for FBOs are suitable for the proposed wireless IoT services based on LPWAN for the reasons set out below –

- (a) For the case of UCL,
 - (i) Wireless IoT services based on LPWAN do not have the attributes of the conventional full fledged public mobile

¹ The only licensee holding the PRSL authorised for the provision of vehicle location information service has just expired on 27 June 2017. The licensee has already ceased the provision of the concerned service and has therefore not sought the renewal of its PRSL.

² There is no longer any licensee holding the PRSL authorised for the provision of one-way data message services.

services which are licensed under the UCL (as explained in paragraph 5 above);

- (ii) It is not suitable to impose the same level of stringent regulatory control as the UCL (such as the requirements on interconnection, number portability, emergency call services, accounting practices, etc.) on wireless IoT services through LPWAN in view of its smaller scale of operation and data conveyance among devices;
 - (iii) Existing licence fee under the UCL may not be proportionate and reasonable in view of the lower estimated administrative cost of OFCA to handle a smaller scale of wireless IoT network based on LPWAN technologies and the possible tremendous growth of such IoT devices; and
- (b) The PRSL is also not suitable because the legacy licensing regime (including licence conditions) is outdated and not appropriate for regulating the new wireless IoT services.

Having regard to the above considerations, OFCA therefore finds it appropriate and well justified to create a new licence so as to regulate the provision of the wireless IoT services based on LPWAN technologies.

PROPOSED FORM AND CONDITIONS OF THE NEW LICENCE

8. Pursuant to section 7(6) and 7(8) of the TO, the Communications Authority (“CA”) may determine, for licences other than exclusive licences and carrier licences, the form of licences, the conditions of licences, the period for which a licence is valid, the types of licences to be issued and the fees payable, and shall publish in the Gazette the form of a licence and the general conditions (“GC”) of the licence. The draft WIoT Licence (at **Annex**) is similar to UCL and PRSL in structure with three main parts, namely GC, special conditions (“SC”) and Schedules.

Licence Conditions

9. The proposed licence conditions of the WIoT Licence would be modelled on the current set of licence conditions for the UCL³ with removal of irrelevant conditions and insertion of new conditions appropriate for the wireless IoT operation. The licence conditions of the WIoT Licence can be divided into two parts –

- (a) GCs 1 – 16 and SCs 1 – 17
- (b) New GCs 17 – 18 and SCs 18 – 19

GCs 1 – 16 and SCs 1 – 17

10. GCs 1 – 16 and SCs 1 – 17 are basically equivalent to the licence conditions under the UCL with removal of conditions irrelevant to the wireless IoT operation, for example, the obligations specific to the provision of fixed services, those related to the provision of real-time voice services, and requirements in respect of spectrum assigned through market mechanism, etc.

New GCs 17 – 18 and SCs 18 – 19

11. On the other hand, OFCA proposes to insert new licence conditions taking reference to the conditions of other licences such as the PRSL⁴, the Services-Based Operator (“SBO”) licence⁵ and the Class licence for the Provision of Public Wireless Local Area Network Services⁶ (“Class Licence”) as explained below –

- (a) Period of Validity and Licence Fee (GCs 17 and 18)

³ The sample UCL is at http://www.coms-auth.hk/filemanager/common/licensing/sample_ucl_licence.pdf.

⁴ The form of PRSL together with the GCs is at http://www.coms-auth.hk/filemanager/common/licensing/PRS_form_conditions_e.pdf.

⁵ The form of SBO licence together with the GCs is at http://www.coms-auth.hk/filemanager/common/licensing/SBO_form_conditions_e.pdf.

⁶ The form of Class licence together with the conditions is at [http://www.coms-auth.hk/filemanager/common/licensing/Wireless_Local_Area_Network_Services_\(Eng\).pdf](http://www.coms-auth.hk/filemanager/common/licensing/Wireless_Local_Area_Network_Services_(Eng).pdf).

Similar to the PRSL and the SBO licence, these licence conditions will specify that the period of validity and licence fee of the WIoT Licence shall be determined and published by the CA. The proposed length of the period of validity and the amount of licence fees will be explained in paragraphs 13 to 14 below.

(b) Shared Use of Frequencies (SC 18)

Noting that the concerned frequency band of 920 – 925 MHz will be used on a shared basis, an SC similar to condition 7.3 of the Class Licence will be prescribed making clear that the use of specified frequencies in the concerned band is shared with other applications in an uncoordinated manner and therefore not protected from harmful interference caused by other radio equipment.

(c) Demonstration (SC 19)

At present, the 920 – 925 MHz band is deployed for the operation of RFID equipment on a no-protection and shared basis pursuant to the Exemption Order in Hong Kong. It is noted that the use of RFID is very common and popular amongst various industries in Hong Kong such as the tracking of luggage in the Hong Kong International Airport and smart-meter programmes by electricity companies to track power usage of individual households etc. In view of the pervasiveness of RFID equipment in Hong Kong, there is a need to ensure that the proposed wireless IoT networks based on LPWAN should not adversely affect the existing use of RFID equipment. It is therefore recommended to impose obligations on the licensee to ensure that it shall conduct demonstrations, trials and tests to the satisfaction of the CA/OFCA to ensure no harmful interference to existing users in the shared frequency band.

Schedules

12. The WIoT Licence will comprise three schedules which stipulates the scope of service, description of network, and technical particulars of radio stations for the provision of the service respectively. Among others, having regard to the characteristics of the wireless IoT services, the scope of service as specified under Schedule 1 will make clear that nothing in the WIoT Licence authorizes the licensee to provide service which carries real-time voice communications.

PROPOSED PERIOD OF VALIDITY AND LICENCE FEE PAYMENT

Period of Validity

13. Having regard to the nature and novelty of the wireless IoT services, it is proposed that the WIoT Licence will be valid for five years from the day on which it is issued with the following considerations –

- (a) since IoT networks based on LPWAN are expected to be of a smaller scale of operation initially and the concerned IoT services could be fast developing in the future, the licence period is proposed to be shorter than that of other existing facility-based licences, namely the UCL (15 years) and the PRSL (10 years), so as to allow timely review of the regulation and licensing regime after the launch of the wireless IoT services based on LPWAN technologies in Hong Kong; and
- (b) the proposed licence with a term of five years will provide a reasonable time frame for licensees to roll out their networks and develop their new WIoT services to meet the public demand. Licensees may continue their operation through application for new licences before expiry of the current ones.

Licence Fee

14. Under the cost-recovery principle, the licence fee for the WIoT Licence should aim to recover the cost of administering the WIoT Licence by OFCA. The proposed licence fee for the WIoT Licence and the fee components are explained below –

(a) Fixed Fee

The level of fixed fee is proposed to be at the level of \$100,000.

(b) Base Station Fee

It is proposed that the structure and levels of the base station fee for the proposed WIoT Licence should be identical to that for the UCL and the PRSL, that is \$1,000 each for the 1st to the 50th base station, \$500 each for the 51st to the 100th base station and \$100 each for the 101st and thereafter base station.

(c) Wireless IoT Device Fee

It is proposed that the wireless IoT device fee for the proposed WIoT Licence should be initially set at a level of \$200 for each 100 wireless devices or less used by customers of the service, i.e. \$2 each, which is much lower than the fee of \$7 per customer connection under the UCL or per mobile station under the PRSL for the provision of paging services. The proposed level should be reasonable taking into account the characteristics of wireless IoT device as distinguished from a typical mobile or paging device and the shared use of frequencies with other devices.

15. Considering that the 920 – 925 MHz band for the proposed wireless IoT services through LPWAN is used on a shared basis with minimal administration by OFCA, no spectrum management fee is proposed to be applied for the use of the shared frequency band and this is in line with the arrangement under the UCL for the use of spectrum on a similar shared and no-protection basis. Furthermore, as the proposed WIoT Licence will not be

authorised to provide real-time voice communications, no subscriber numbers will be allocated to the licensees. Therefore, no number fee will be applicable to the WIoT Licence.

WAY FORWARD

16. OFCA will take into consideration all views and comments received when finalising the proposed licensing regime for the WIoT Licence for consideration by the CA. Subject to the approval of the CA, OFCA expects to gazette the form of the WIoT Licence and issue licences to the applicants fulfilling the licensing requirements in September/October 2017. By then, any party including existing licensees who may be interested in providing IoT services based on LPWAN technologies with the use of the 920 – 925 MHz band may make application to the CA for the WIoT Licence.

17. Apart from the LPWAN technologies operating in the 920 – 925 MHz band under the proposed WIoT Licence, OFCA is aware of the fact that there are other types of enabling technologies for the provision of wireless IoT services, including cellular mobile technologies (such as Narrowband IoT in 4G LTE) operating with the frequency spectrum assigned for the provision of public mobile services. Under the existing terms and conditions of the UCLs for the provision of public mobile services, mobile network operators (“MNO”s) are already permitted to operate wireless IoT services if they are provided as part of their existing public mobile services with use of the same frequency spectrum assigned under their existing UCLs. In this regard, such provision of wireless IoT services by MNOs will be subject to the same set of licence conditions under their existing UCLs, and the variable licence fee based on among others, customer connections under the UCL regime will apply. If any MNO has a plan for massive deployment of wireless IoT services with use of the assigned frequency spectrum under its UCL, it is welcome to submit its proposal to OFCA which may consider any necessary changes to the current UCL regime, such as introduction of a variable licence fee for devices solely for IoT services, with a view to facilitating the development of the proposed service.

18. Subject to the development and experience on the implementation of wireless IoT services in Hong Kong, OFCA is mindful that there may be a need to further review and streamline the licensing regimes (including licence conditions and licence fee) for the provision of wireless IoT services within five years, i.e. before end of the validity period of the first WIoT Licence to be issued.

VIEWS SOUGHT

19. Members are invited to give views and comments on the proposed creation of the WIoT Licence.

**Office of the Communications Authority
August 2017**

**TELECOMMUNICATIONS ORDINANCE
(Chapter 106)**

PUBLIC WIRELESS INTERNET OF THINGS SERVICE LICENCE

DATE OF ISSUE: []

[Company Name]

.....
of [Address]
.....

(the “licensee”) is licensed, subject to the following conditions set out in this licence –

- (a) to provide a public telecommunications network service (the “service”), the scope of which is described in Schedule 1;
- (b) to establish and maintain a telecommunications network (the “network”) described in Schedule 2 to provide the service;
- (c) to possess and use the radiocommunications installations described in Schedule 3 to provide the service; and
- (d) to deal in, import and demonstrate, with a view to sale in the course of trade or business, such apparatus or material for radiocommunications as may be necessary to supply customers of the service.

GENERAL CONDITIONS

1. DEFINITIONS AND INTERPRETATION

- 1.1 In this licence, except as hereinafter provided or unless the context otherwise requires, words or expressions shall have the meanings assigned to them in the Telecommunications Ordinance (Cap. 106) (the “Ordinance”) and, as the case may be, the Interpretation and General Clauses Ordinance (Cap. 1). For the purposes of interpreting this licence, headings and titles shall be disregarded.
- 1.2 This licence shall not be construed as granting an exclusive right to the licensee to provide the service.
- 1.3 This licence replaces any licence or any exemption from licensing, however described, which the Authority may have granted to the licensee for providing the service.
- 1.4 The grant of this licence does not authorize the licensee to do anything which infringes any exclusive licence granted under the Ordinance or any exclusive right to operate and provide telecommunications networks, systems, installations or services granted under any other Ordinance.

2. TRANSFER

- 2.1 The licensee may, only with the prior written consent of the Authority and subject to such reasonable conditions as the Authority thinks fit, transfer this licence or any permission, right or benefit under this licence. In giving its consent the Authority will have regard to such matters as it thinks fit including but not limited to the effect which the transfer will have on market structure and the financial and technical competence and viability of the transferee.

3. INTERNATIONAL CONVENTIONS

- 3.1 The licensee shall at all times perform and observe the requirements of the Constitution and Convention of the International Telecommunication Union

and the regulations and recommendations annexed to it, as are stated to be applicable to Hong Kong, and any other international convention, agreement, protocol, understanding or the like to the extent that the instruments described in this General Condition 3.1 impose obligations on Hong Kong of which the Authority gives notice to the licensee, except to the extent that the Authority may in writing exempt the licensee from such compliance.

- 3.2 Where the Government has been consulted about or is involved in the preparation or negotiation of an international convention, agreement, protocol or understanding or the like or amendments thereto which are on the subject-matter of telecommunications or which relate to another subject-matter but which the Government anticipates could have a material impact on the provision of the service under this licence, the Government will, where practicable, provide the licensee with a reasonable opportunity to make a submission stating its views on the matter.

4. COMPLIANCE GENERALLY

- 4.1 The licensee shall comply with the Ordinance, regulations made under the Ordinance, licence conditions or any other instruments which may be issued by the Authority under the Ordinance.

5. PROVISION OF SERVICE

- 5.1 The licensee shall, subject to Schedule 1 to this licence and any special conditions of this licence relating to the provision of the service, at all times during the validity period of this licence operate, maintain and provide a good, efficient and continuous service in a manner satisfactory to the Authority. The Authority may, on application in writing by the licensee, exempt a part or parts of the service from the requirement of continuous provision.

6. CONFIDENTIALITY OF CUSTOMER INFORMATION

- 6.1 The licensee shall not disclose information of a customer except with the

consent of the customer, which form of consent shall be approved by the Authority, except for the prevention or detection of crime or the apprehension or prosecution of offenders or except as may be authorized by or under any law.

- 6.2 The licensee shall not use information provided by its customers or obtained in the course of provision of service to its customers other than for and in relation to the provision by the licensee of the service.

7. RECORDS AND PLANS OF NETWORK

- 7.1 The licensee shall keep records and plans (including overall network plans and cable route maps) of the telecommunications installation (including radiocommunications installation) and telecommunications nodes and exchanges, if any, provided under this licence and any other details concerning the network as may be reasonably required by the Authority, including but not limited to information from operational support systems, traffic flow information, and database information relating to the manner in which the network treats any communication (“network information”).

- 7.2 As required by the Authority, the licensee shall make the network information available, within reasonable time, to the Authority or to a person authorized in writing by the Authority for inspection for the Authority’s own purposes.

8. CONTROL OF INTERFERENCE AND OBSTRUCTION

- 8.1 The licensee shall take reasonable measures to install, maintain and operate the service and the network in such a manner as not to cause any harmful interference or physical obstruction to any lawful telecommunications service, or cause any physical obstruction to the installation, maintenance, operation, adjustment, repair, alteration, removal or replacement of the facilities of any lawful telecommunications or utility service provider.

- 8.2 The licensee shall take reasonable measures to ensure that the customers of the service do not cause harmful interference to lawful telecommunications services or utility services through use of the service.

8.3 The Authority may give such reasonable directions as it thinks fit to avoid harmful interference or physical obstruction referred to in General Condition 8.1. The licensee shall comply with the directions.

9. COMPLIANCE

9.1 If the licensee employs any person under contract for the purpose of the service, or for the installation, maintenance or operation of the network (a “contractor”), the licensee shall continue to be responsible for compliance with the conditions of this licence, and the performance thereof, by any contractor.

10. REQUIREMENTS OF RADIOCOMMUNICATIONS INSTALLATION

10.1 Each radiocommunications installation operated by or on behalf of the licensee shall be used only at the location and with emissions and at the frequencies and of the classes and characteristics specified in Schedule 3 to this licence and with such power and aerial characteristics as are specified in that Schedule in relation to the class and characteristics of the emission in use.

10.2 The apparatus comprised in each radiocommunications installation shall at all times comply with such technical standards as may be issued by the Authority.

10.3 The apparatus comprised in a radiocommunications installation shall be of a type approved by the Authority and shall be so designed, constructed, maintained and operated that its use shall not cause any interference to any radiocommunications.

10.4 A radiocommunications installation shall be operated only by the licensee or a person authorized by the licensee. The licensee shall not allow an unauthorized person to have access to the apparatus comprised in a radiocommunications installation. The licensee shall ensure that persons operating each radiocommunications installation shall at all times observe

the conditions of this licence.

10.5 The licensee shall not make a change –

- (a) to any radiocommunications installation; or
- (b) of the location of any radiocommunications installation,

without the prior written approval of the Authority.

10.6 If any telecommunications installation (including radiocommunications installation) crosses above or may fall or be blown onto any overhead power wire (including electric lighting and tramway wires) or power apparatus it shall be guarded to the reasonable satisfaction of the owner of the power wire or power apparatus concerned.

11. USE OF FREQUENCIES

11.1 The radiocommunications installation operated by or on behalf of the licensee shall only be operated on such frequencies as the Authority may assign.

12. SAFETY

12.1 The licensee shall take proper and adequate safety measures for the safeguarding of life and property in connection with all installations, equipment and apparatus operated or used, including safeguarding against exposure to any electrical or radiation hazard emanating from the installations, equipment or apparatus operated or used under this licence.

12.2 The licensee shall comply with the safety standards and specifications as may from time to time be prescribed by the Authority and any directions of the Authority in relation to any safety matter.

13. PROHIBITION OF CLAIMS AGAINST GOVERNMENT

13.1 The licensee shall have no claim against the Government in tort or in

contract in respect of any disturbance or interruption to any part of the network due to works carried out by or on behalf of the Government which result in disturbance to the network.

14. INDEMNITY

- 14.1 The licensee shall indemnify the Government against any losses, claims, charges, expenses, actions, damages or demands which the Government incurs or which may be made against the Government as a result of or in relation to the activities of the licensee or any employee, agent or contractor of the licensee in relation to the provision of the service or the installation, maintenance and operation of the network.

15. CONTRAVENTION BEYOND LICENSEE'S CONTROL

- 15.1 The licensee shall not be liable for any breach of this licence where it is able to demonstrate, to the reasonable satisfaction of the Authority, that the breach was caused by circumstances beyond its control and that it has taken all reasonable steps open to it to rectify that breach.
- 15.2 Where the circumstances referred to in General Condition 15.1 are such that there is an outage or interruption in the service affecting a significant number of the licensee's customers for a period of more than 7 days, the licensee shall provide the Authority with a full report in writing detailing the reasons for the breach and indicating when, or if, it will be able to continue to provide the service.
- 15.3 If the Authority is, after considering a report provided under General Condition 15.2, of the reasonable belief that the licensee would be able to provide the service within a reasonable period of time despite the circumstances outlined in that report, the Authority may direct that the licensee recommence the service within such reasonable period as the Authority may in writing direct. The licensee shall comply with such direction.

16. PUBLICATION OF LICENCE

16.1 The licensee, or the Authority, may at their discretion make the terms and conditions of this licence, including any specific conditions, publicly available in any manner they think fit.

17. PERIOD OF VALIDITY

17.1 This licence shall be valid for such period as determined by the Authority and be published at the time of the issue.

18. LICENCE FEES

18.1 The licensee shall pay the fees applicable to this licence as may from time to time be determined and published by the Authority.

DRAFT

SPECIAL CONDITIONS

1. COMPLIANCE WITH CODES OF PRACTICE

- 1.1. The licensee shall comply with such guidelines or codes of practices which may be issued by the Authority as in its opinion are suitable for the purpose of providing practical guidance on any particular aspect of any conditions of this licence.

- 1.2 Without limiting or affecting in any way the licensee's obligations under any other licence condition, the licensee shall comply with any code of practice or guideline which may be issued by the Authority from time to time for the purpose of providing practical guidance to the licensee in respect of –
 - (a) the provision of satisfactory service;
 - (b) the protection of customer information;
 - (c) the protection and promotion of the interests of consumers of telecommunications goods and services; and
 - (d) calling line identification and other calling line identification related services.

- 1.3 Before issuing any code of practice or guideline referred to in Special Condition 1.2, the Authority shall carry out such consultation as is reasonable in all the circumstances of the case.

- 1.4 Without limiting the generality of Special Condition 1.2(d), the code of practice or guideline issued under that Special Condition may require the licensee to validate the calling line identification against the authenticated customer in order to prevent fraud and spam.

2. NUMBERING PLAN

- 2.1 The licensee shall comply with the numbering plan made or approved by the Authority and any directions given by the Authority in respect of the numbering plan.
- 2.2 The licensee shall at the request of the Authority or otherwise consult the Authority about the arrangements for the allocation and reallocation of numbers and codes within the numbering plan.
- 2.3 Where requested by the Authority, the licensee shall prepare and furnish to the Authority proposals for developing, adding to or replacing the numbering plan relating to the service.

3. REQUIREMENT TO FURNISH INFORMATION TO THE AUTHORITY

- 3.1 The licensee shall furnish to the Authority, in such manner and at such times as the Authority may request in writing, such information relating to the business run by the licensee under this licence, including financial, technical, and statistical information, accounts and other records, as the Authority may reasonably require in order to perform its functions under the Ordinance and this licence.
- 3.2 Subject to Special Condition 3.3 the Authority may use and disclose information to such persons as the Authority thinks fit.
- 3.3 Where the Authority proposes to disclose information obtained and the Authority considers that the disclosure would result in the release of information concerning the business or commercial or financial affairs of a licensee which disclosure would or could reasonably be expected to adversely affect the licensee's lawful business or commercial or financial affairs, the Authority will give the licensee a reasonable opportunity to make representations on the proposed disclosure before the Authority makes a final decision whether to disclose the information.

4. TARIFFS

- 4.1 The licensee shall publish and charge no more than the tariffs for the service operated under this licence. The tariffs shall include the terms, as defined under section 7F(2) of the Ordinance, for the provision of the service.

4.2 Publication of a tariff shall be effected by –

- (a) publication in the website of the licensee on or before the date on which the tariff becomes effective;
- (b) placing a copy of the tariff in a publicly accessible part of the principal place of business and other business premises of the licensee as specified by the Authority; and
- (c) supplying a copy of the relevant details to any person who may request it, at a charge no greater than is necessary to recover reasonable costs of making and supplying the copy.

4.3 The Authority may by direction in writing, for such period and on such conditions as the Authority may determine, direct that either one or any combination of Special Conditions 4.2(a), (b), and (c), either completely or as to particular obligations imposed under them, shall not apply to the licensee.

5. BILLING AND METERING ACCURACY

5.1 The licensee shall take all reasonable steps to ensure that any metering equipment and billing system used in connection with the service is accurate and reliable.

5.2 At the written request of the Authority or at regular intervals to be specified by the Authority, the licensee shall conduct tests on its metering equipment and billing system to assess its accuracy, reliability and conformity to the technical standards, if any, specified by the Authority. The licensee shall submit the test result to the Authority within 14 days after the date of the relevant test or such other longer period as the Authority may determine.

5.3 The licensee shall keep such records of any metering equipment and billing system in such form as may be specified by the Authority and shall supply such records to the Authority as soon as reasonably practical following a written request from the Authority.

6. PROVISION OF SERVICE

6.1 The licensee shall, subject to Schedule 1 and any special conditions of this licence relating to the provision of the service, provide the service on its published terms and conditions and at the tariff published in accordance with Special Condition 4 (as applicable), on request of a customer whether or not the customer intends the service to be available for its own use or intends to utilize the service to provide a lawful telecommunications service to third parties.

6.2 Subject to Schedule 1 and any special conditions relating to the provision of the service, the licensee shall comply with a customer request for the service as tariffed by the licensee in accordance with Special Condition 4 where the service can reasonably be provided by the licensee to the customer utilizing the licensee's network in place at the time of the request.

7. RECORDS AND PLANS OF THE NETWORK

7.1 The Authority may disclose the network information in accordance with section 7I(3) of the Ordinance.

7.2 The licensee shall, at the reasonable request of any other licensee under the Ordinance if so authorized by the Authority, give reasonable access to its network information for the facilitation of network planning, maintenance and reconfiguration required for the purposes of section 36AA of the Ordinance. The licensee shall be permitted to charge the requesting party so as to be fairly compensated for the reasonable relevant costs incurred in the provision of such network information.

7.3 Where the licensee and any other licensee that has requested access to the network information in accordance with Special Condition 7.2 are unable to agree what amounts to reasonable access (including confidentiality requirements and fair compensation for the reasonable relevant costs incurred) or a reasonable request, the matter at issue may be referred by either the licensee or the other licensee to the Authority for determination. The licensee shall pay to the Authority, as it may require, any costs or expenses incurred by the Authority, including, without limitation, staff costs and expenses, and the financing of liabilities paid out of the Office of the Communications Authority Trading Fund in respect of such a determination

or determination process.

8. NETWORK LOCATION

- 8.1 The licensee shall keep accurate records of the location of the network installed under, in, over or upon any land.
- 8.2 The licensee shall mark or otherwise identify every wire laid or telecommunications installation installed by the licensee or any contractor on its behalf throughout the course of the wire, or at the location of the installation, so as to distinguish it from any other wire or telecommunications installation laid or installed in Hong Kong.
- 8.3 The licensee shall provide, at such intervals as the Authority may determine, distinguishable surface markers of the underground position of the network.

9. CHANGES TO THE NETWORK

- 9.1 For the purposes of this licence, a change in the network is a material change where the implementation of the change would result in the network no longer being in compliance with any relevant technical standard which the Authority has power to issue.
- 9.2 The licensee shall notify the Authority of any proposals for material changes to the network and provide it with such information as the Authority reasonably requires.
- 9.3 The licensee shall not, without the prior consent in writing of the Authority, make any material changes which might reasonably be anticipated by the licensee to affect –
- (a) any telecommunications service or installation connected to the network;
 - (b) a person producing or supplying telecommunications apparatus for connection to the network;

- (c) a licensee under the Ordinance;
- (d) a licensee under the Broadcasting Ordinance (Cap. 562); or
- (e) a customer or a consumer of goods and services provided by any person or entity,

if the change is in the opinion of the Authority likely to require modifications or replacements to, or cessation in the production or supply of any of the telecommunications apparatus involved, or if the proposed alteration would require substantial network reconfiguration or rerouting.

- 9.4 The licensee shall prepare and publish, after consultation with the Authority, its procedures for consulting with and giving notice to persons likely to be affected materially by changes to its network which are required to be notified in accordance with Special Condition 9.2 and any other changes required to be notified pursuant to any technical standard which the Authority has power to issue. Subject to approval of the Authority, the notification procedures to each of the classes of persons likely to be affected under Special Condition 9.3 may differ having regard to the practicality and costs of notifying them.

10. WITHDRAWAL AND RETURN OF FREQUENCIES

- 10.1 Without prejudice to the generality of section 32H of the Ordinance, the Authority may by notice in writing withdraw any frequency previously assigned to the licensee if in the opinion of the Authority the licensee is not making efficient use of that frequency or in exceptional circumstances including where the public interest or international obligations of the Government so require, there is a serious breach of spectrum assignment conditions or serious interference between legitimate spectrum users has to be resolved or minimised.
- 10.2 The licensee may, subject to prior consent of and conditions specified by the Authority, return any frequency previously assigned to it.

11. CIRCUMSTANCES OUTSIDE LICENSEE'S CONTROL

- 11.1 For the avoidance of doubt, General Condition 15.1 of this licence shall apply to these special conditions and the Authority may at its discretion, and on such conditions as it thinks fit, extend any time period within which the obligations of the licensee under these special conditions may be met.
- 11.2 In exercising its discretion under Special Condition 11.1 with respect to any of the special conditions of this licence, the Authority shall take into account including, without limitation, whether circumstances are such that it would be unreasonable to require compliance by the licensee with the relevant special condition.

12. INSURANCE

- 12.1 Throughout the currency of this licence, the licensee shall have and maintain a valid insurance policy with a reputable insurance company to cover its third party liabilities in respect of personal injury, death and damage to property, arising out of or in connection with the installation, maintenance and operation of the network or provision of the service. The amount of insurance shall be at least HK\$10,000,000 per occurrence or such sum as the Authority may notify in writing in future.

13. USE OF PUBLIC FACILITIES FOR PROVISION OF SERVICES

- 13.1 Without limiting or affecting in any way the licensee's obligations under any other condition of this licence, the licensee shall comply with any guidelines or codes of practice which may be issued by the Authority from time to time for the purpose of providing practical guidance to the licensee in respect of the use of Government facilities as well as facilities on Government property and unleased Government land for the provision of services under this licence.

14. LOCATION SERVICES

- 14.1 Without affecting the generality of General Condition 6, "information of a customer" referred to in General Condition 6.1 and "information provided by its customers or obtained in the course of provision of service to its

customers” referred to in General Condition 6.2 shall include any information concerning the locations of customers obtained in the course of provision of the service.

14.2 Where the licensee provides services to customers using the information concerning the locations of the customers obtained in the course of provision of the service, the licensee shall ensure that –

- (a) no such services are provided without the prior consent of the relevant customers; and
- (b) the customers are capable of suspending the use of the information from time to time.

14.3 For the purpose of Special Condition 14, “customers” include all users of the service and “locations of customers” include the location of any equipment and device obtained and used by or supplied to any user of the service by the licensee, its agent or any person under contract or other arrangement with the licensee for the provision of the service under this licence. For the avoidance of doubt, the reference to the term “users” includes end users of the service and service providers making use of the service to serve their own customer.

15. PROVISION OF INFORMATION TO CUSTOMERS

15.1 Without prejudice to the other terms and conditions of this licence, the licensee shall provide or make available the following information to the customers when the services are offered –

- (a) Name of the licensee;
- (b) Licence number of the licensee under this licence;
- (c) Customer service hotline number(s);
- (d) Where applicable, the access code(s) or number(s) (including any access password) used for obtaining the services;

- (e) Instructions on how to access the services;
- (f) The tariffs under which the services are offered; and
- (g) The duration or validity period of the services offered.

16. INTERPRETATION

- 16.1 Any reference to an ordinance or a regulation, whether the word is used by itself or as part of any title to an ordinance or a regulation, shall mean that ordinance or regulation for the time being in force as well as any modification or substitution of that ordinance or regulation, in whole or in part, and all subsidiary legislation, regulations, directions, codes of practice and instruments made under that ordinance or regulation and for the time being in force.
- 16.2 The singular includes the plural and vice versa.

17. SERVICE CONTRACTS AND DISPUTE RESOLUTION

- 17.1 The licensee shall comply with all codes of practice issued by the Authority from time to time in respect of the requirements to apply in the contracting of telecommunications services to end users.
- 17.2 The contracting requirements referred to in Special Condition 17.1 may include the following –
- (a) the style, format and structure of service contract documentation;
 - (b) the manner of entering into and terminating service contracts;
 - (c) the information to be included in or in connection with service contracts and the performance of the services;
 - (d) the submission of disputes between end users and the providers of telecommunications services to independent dispute resolution, pursuant to a scheme approved by the Authority; and
 - (e) other terms and conditions or provisions for the protection of the interests of end users.
- 17.3 Before issuing any code of practice for the purposes of Special Condition

17.1, the Authority shall carry out such consultation as is reasonable in the circumstances.

18. SHARED USE OF FREQUENCIES

18.1 The use of the frequencies assigned as specified in paragraph 1 of Schedule 3 is shared with other users and applications in an uncoordinated manner and therefore the use of the frequencies is not protected from any interference caused by other telecommunications installations or radio equipment operating in accordance with the provisions of the Ordinance, or regulations or orders made under the Ordinance.

19. DEMONSTRATION

19.1 The licensee shall conduct such demonstrations, trials and tests as and when required and in the manner stipulated by the Authority to demonstrate to the satisfaction of the Authority or the Authority's authorized representative its compliance with General Condition 8 and any other applicable licence condition.

SCHEDULE 1

SCOPE OF THE SERVICE

1. The service is a wireless data communications service provided through radiocommunications installations, apparatus, equipment and device operating at the frequencies and using technical parameters specified in Schedule 3 to enable two-way automated communications to and from such installations, apparatus, equipment and device in Hong Kong.
2. Nothing in this licence authorizes the licensee to provide:
 - (a) service which carries real-time voice communications; and
 - (b) any other service subject to licensing under the Ordinance or any other ordinance.

SCHEDULE 2

DESCRIPTION OF NETWORK

All such telecommunications installations established, maintained, possessed or used whether owned by the licensee, leased, or otherwise acquired by the licensee for the purpose of providing the public telecommunications network services specified in Schedule 1.

SCHEDULE 3

TECHNICAL PARTICULARS OF RADIO STATIONS FOR THE PROVISION OF THE SERVICE

1. Frequency: Transmitting and receiving frequencies for each radiocommunications installation shall be within the following frequency bands. Details are contained in the listing incorporated into Schedule 3 in accordance with

section 8(3) of the Telecommunications Regulations (Cap. 106A):

920 – 925 MHz

2. Technical Standard: For the radio interface using the transmitting frequencies employed by the radio stations, the licensee shall only use widely recognized standards as approved by the Authority. The licensee shall submit proof to the satisfaction of the Authority that the technical standard used complies with the requirement under this Schedule.

3. Location:) Details are contained in the
4. Class of emission:) listing incorporated into
5. Type of modulation:) Schedule 3 in accordance with
6. Maximum frequency tolerance:) section 8(3) of the
7. Maximum effective radiated power:) Telecommunications Regulations
8. Aerial characteristics:) (Cap.106A).

Remarks:

1. For the purpose of Schedule 3, the maximum permissible height of antenna above mean sea level shall be in compliance with the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301).

2. The licensee shall comply with the standards and certification requirements as prescribed from time to time by the Authority under the Ordinance. The licensee shall also comply with the “Code of Practice for the Protection of Workers and Members of Public Against Non-Ionizing Radiation Hazards from Radio Transmitting Equipment” issued and as revised from time to time by the Authority.
