Licensing of Mobile Services on Expiry of Existing Licences for Second Generation Mobile Services

Analysis of Comments Received, Preliminary Conclusions and Further Consultation

19 March 2004

INTRODUCTION

Background

At present, second generation (2G) mobile services are licensed under the Public Radiocommunications Service (PRS) licences pursuant to the Telecommunications Regulations (Cap. 106A). Of the eleven 2G PRS licences, five operate in the 825 - 960 MHz bands, providing Public Mobile Radiotelephone Services (PMRS) based on the GSM 900 standard (three systems), IS-95 CDMA standard (one system) and IS-136 TDMA standard (one system). The remaining six licences operate in the 1710 - 1880 MHz bands providing Personal Communications Services (PCS) using the GSM 1800 standard.

2. On 1 August 2003, the Telecommunications Authority (TA) issued a consultation paper on licensing of mobile services on expiry of existing 2G licences (First Consultation Paper). In the First Consultation Paper, the TA discussed the pertinent technical issues, including the availability of frequency spectrum and related constraints. He also gave an overview of his preliminary considerations regarding the assignment of the relevant frequency spectrum and the future regulatory framework of the services upon the expiry of the current PRS licences.

3. At the deadline for submission of comments on 2 October 2003, the TA received a total of 23 submissions, which were subsequently published on the web site of the Office of the Telecommunications Authority (OFTA) at http://www.ofta.gov.hk. The submissions were received from:-

- China Unicom International Ltd (CUIL)
- Mr Joseph Tsui, Symphonic InfoCom Limited
- Asia Pacific Broadband Wireless Communications Inc. (APBWC)
- Motorola (China) Electronics Ltd (Motorola)
- Nortel Networks (Asia) Limited (Nortel)
- CDMA Development Group (CDG)
- Ericsson (HK) Ltd (Ericsson)
- Qualcomm International (Qualcomm)
- New World PCS Limited (NWPCS)
- Wharf T&T Limited (WT&T)
- Lucent Technologies (China) Co Ltd (Lucent)
- China Unicom Limited (CUL)
- Peoples Telephone Company Limited (Peoples)
- Kowloon-Canton Railway Corporation (KCRC)
- Hong Kong Broadband Network Limited (HKBN)
- Consulate General of Canada (CG of Canada)
- The American Chamber of Commerce (ACC)
- Consumer Council
- SmarTone Mobile Communications Limited (SMC)
- PCCW-HKT Telephone Limited (PCCW-HKT)
- CSL Limited (CSL)
- Hutchison Telephone Company Limited (HTCL)
- SUNDAY o/b Mandarin Communications Limited (SUNDAY)

4. The TA duly considered the views and comments made in the submissions. He also reviewed the latest developments in the mobile market. In this consultation paper, the TA will present his recommendations regarding frequency spectrum allocation and regulatory framework for the new mobile service licences upon expiry of the existing PRS licences. In the rest of this document, the terms “GSM licence”, “PCS licence”, “CDMA licence” and “TDMA licence” will be used to denote the existing PRS licences deploying GSM 900, GSM 1800, IS-95 CDMA and IS-136 TDMA standards respectively.

New Licensing Vehicle

5. The period of validity of PRS licences is expressly provided under section 2(2A) of the Telecommunications Regulations. A PRS licence shall be

valid for 10 years from the day on which it is granted and may, subject to the discretion of the TA, be extended for a further period of up to 3 years.

6. As explained in the First Consultation Paper, the TA had exercised his discretion in year 2001 extending the five PRS licences operating in the 825 - 960 MHz bands for three years. As a result, the TDMA licence will expire in July 2005, the CDMA licence in November 2005 and the three GSM licences between November 2005 and January 2006. The extension was to facilitate an overall review on the licensing of all of the eleven 2G PRS licences, tying in with the expiry of the six PCS licences in September 2006.

7. Following the enactment of the Telecommunication (Amendment) Ordinance 2000, a streamlined licensing framework has been put in place. In exercise of his power under the new framework, the Secretary for Commerce, Industry and Technology (SCIT) has made the Telecommunications (Carrier Licences) Regulation ("Carrier Licence Regulation"), which prescribes the general conditions, period of validity and licence fees payable for a carrier licence[1]. Such Regulation came into effect on 1 April 2001.

8. As stated in paragraph 35 of the First Consultation Paper, the TA intends to issue the Mobile Carrier Licence for the licensing of the networks and services in the 2G spectrum upon the expiry of the current PRS licences. The Mobile Carrier Licences will have a period of validity of 15 years and will contain all the general conditions that are prescribed under the Carrier Licence Regulation made by the SCIT. The TA may, pursuant to his power under section 7A of the Telecommunications Ordinance, attach special conditions to the Mobile Carrier Licences.

Relevant Considerations in the Future Licensing of Mobile Services

9. In the First Consultation Paper, the TA stated that the following considerations were relevant for deciding the future licensing arrangements for mobile services:-

[1] A "carrier licence" is defined under section 2 of the Telecommunications Ordinance 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 the Schedule to the Ordinance.

- To ensure choice of services
- To provide stable investment environment
- To ensure efficient use of spectrum
- To ensure continuity of customer service
- To maintain technology neutrality

10. Some of the respondents to the First Consultation Paper pointed out that while Hong Kong had a highly competitive mobile market with a mobile penetration rate among the highest in the world, it had a disproportionately low take-up rate in mobile data services and related applications. They further opined that these services and applications would not only generate new revenue streams and increase average revenue per user for the mobile operators, but also help create business opportunities for content providers and application developers. The Government was urged to take steps to stimulate the development of mobile data services in Hong Kong, and to encourage the mobile industry to further exploit the business opportunities and market potentials. The TA agrees to this vision that Hong Kong should continue to develop innovative wireless services and applications with a view to spawning new industries and enhancing Hong Kong's status as the mobile services hub in Asia.

LICENSING ARRANGEMENTS FOR THE EXISTING GSM AND PCS LICENCES

Offer of "Right of First Refusal"

11. In the First Consultation Paper, the TA raised the idea of offering the existing 2G licensees the "right of first refusal" for new licences operating on the existing 2G frequency spectrum. Considering that the two networks operating in the 800 MHz band had not been actively developed and the services not actively marketed, the TA also indicated that the "right of first refusal" should only be offered to the existing GSM and PCS licensees but not to the CDMA and TDMA licensees.

12. All six 2G mobile operators, namely CSL, HTCL, NWPCS, SMC, SUNDAY and Peoples, plus the Consumer Council and KCRC, supported the grant of "right of first refusal" to the existing GSM and PCS licensees. They welcomed the proposal as it would ensure a stable and continuous provision of the existing services and minimize disturbance to both the network operators and the mobile users. On the other hand, other respondents, notably parties who currently did not operate any service in the mobile market (such as PCCW-HKT, WT&T and HKBN), argued that the proposal would put the incumbent operators at an unfair advantage. They opined that in order to maintain a level playing field for all players, parties that were interested to enter the market should be allowed to bid for the frequency spectrum and the licences on an equal footing with incumbent operators.

13. The TA is aware of the consideration to provide a stable investment environment and to ensure continuity of customer service. At present, there are more than 7 million mobile customers in Hong Kong. Discounting the relatively small number of customers subscribing to the CDMA and TDMA services, the GSM and PCS services have become a general commodity penetrating all walks of our society and affecting every aspect of our daily life. The existing GSM and PCS licensees have been providing a satisfactory service with continuous investments and improvements. They have also been making efficient use of the scarce frequency spectrum assigned to them. If they were not allowed to continue offering their services to their customers, there would be severe service interruptions, causing confusion and inconvenience to the public. The social consequence would not be acceptable to society as a whole.

14. The present regulatory framework is designed to encourage and facilitate interested parties to invest in telecommunications infrastructure and the provision of telecommunications services. There being no foreign ownership restrictions in Hong Kong, interested parties who wish to enter the market are free to invest through merger and acquisition. They may also apply for the Mobile Virtual Network Operator licence to provide their own services. Moreover, as explained later in this consultation paper, we will be proposing that interested parties will have the opportunity to enter the market by applying for a new mobile network licence.

15. With the above considerations in mind, **the TA proposes to offer the "right of first refusal" to the nine incumbent GSM and PCS licensees ONLY,** who have been making efficient use of the scarce frequency spectrum assigned to them in the past years. The "right of first refusal" entitles the existing GSM/PCS licensee, who agrees to the proposed licence conditions and exercises the right, to a new mobile carrier licence that shall be granted on the date on which the relevant GSM/PCS licence expires. Should any licensees decline to accept the "right of first refusal", the vacated frequency allocation will be reserved for future use. In that case, the licensees will need to provide reasonable "exit" arrangements to all their subscribers.

Alignment of the Date of New Licences and Extension to the PCS Licences

16. For those incumbent GSM and PCS licensees accepting the "right of first refusal", the TA proposed in the First Consultation Paper that these licences should cease operation and that all the incumbents' new licences should commence operation at the same time. As the expiry dates of the existing 2G licences vary, this proposal would imply that some of the existing licences would have to be surrendered before they expired.

17. HTCL, SUNDAY and Peoples did not support the proposal. Rather, they asked the TA to grant a 3-year extension to their PCS licences. SMC opined that the alignment should be done by extending the period of validity of its GSM licence instead of early surrender of its PCS licence. NWPCS did not object to early surrendering of its licence provided that operation under the existing licence conditions is allowed in the new licence to be issued. On the other hand, CSL supported the proposal. PCCW-HKT opined that the existing

licences should neither be extended nor prematurely terminated. HKBN suggested that to align the commencing dates of the new licences, all existing 2G licences should be surrendered.

18. As explained in paragraph 5 above, it is at the discretion of the TA whether to grant the 3-year extension to the licences or not. In year 2001, the TA already exercised his discretion to extend the GSM, CDMA and TDMA licences. The extension was intended to bring the expiry dates of these licences to the 2005 - 2006 timeframe so that the future licensing arrangement for the mobile services using the current 2G spectrum could be processed in a holistic manner. In any event the TA is not in a position to grant any further extension to the GSM, CDMA and TDMA licences as his discretion to do so can only be exercised once. It also follows that if the TA were to accede to the request of certain PCS licensees for granting an extension to their existing licences, the original policy intention of granting the extension in year 2001 would be defeated. The TA proposes to offer the "right of first refusal" to the six PCS licensees, together with the three GSM licensees, for reasons as set out in paragraphs 13 to 15 above. **Accordingly, the TA is therefore of the view he should not exercise his discretion to extend the PCS licences even if he receives any application for him to do so**.

19. **Considering that the respondents were generally not supportive of the proposal to align the dates of the new licences, the TA would not pursue this initiative**. Prior to the expiry dates of the existing GSM and PCS licences, the TA will offer the incumbent licensees the "right of first refusal", which will have to be exercised before a specified deadline. If the licensees exercise the "right of first refusal" and accept a new licence, the commencement dates of the new licences will immediately follow the expiry of the existing licences so as to assure an uninterrupted operation of the existing mobile services.

Need for Rationalizing the Existing Frequency Allocations

20. In the First Consultation Paper, the TA proposed to rationalize the frequency allocations of the incumbent 2G licensees. CSL, HTCL, Peoples, SMC and SUNDAY considered that the proposed rationalization would be difficult and costly. The Consumer Council advised that the rationalization should take into account practical constraints like equipment availability and roaming capabilities. NWPCS supported the rationalization but it advised that

it was necessary to design the migration procedures and to conduct a cost-benefit study first.

21. In the conversion from the analogue to the 2G digital services in the early nineteen nineties, the rationalization of frequency bands took place over a period stretching from 1992 to 2000. Local mobile network operators should have accumulated substantial experience of such a migration programme. Nonetheless, **the TA accepts that there are no overriding policy concerns to implement the rationalization at the present moment.** The constraints and difficulties highlighted in the industry submissions also reflect the lack of commercial incentives to implement the rationalization programme immediately. However, in future, when the licensees wish to deploy advanced mobile services in the existing 2G spectrum, contiguous frequency allocations in multiples of 2 x 5 MHz for the incumbent operators may be necessary. To convert fragmented frequency allocations to contiguous frequency allocations, seed spectrum will inevitably be required. **In anticipation of such a requirement, the TA will reserve sufficient seed spectrum in the 800 and 1800 MHz frequency bands.** More details on the reservation of the seed spectrum are given in paragraphs 44 to 47, 51 and 52 of this document.

ARRANGEMENTS FOR THE EXISTING CDMA AND TDMA LICENCES

"Right of First Refusal" Not to be Offered

22. In the First Consultation Paper, the TA pointed out that the CDMA and TDMA licensees had not actively developed and marketed their services. In the interest of efficient utilization of the scarce spectrum, the TA opined that the "right of first refusal" should not be offered to these two licensees.

23. In response, HTCL (the incumbent CDMA licensee) submitted that the licensing arrangement for its CDMA licence should be treated fairly and it expected to renew the licence in accordance with existing terms and conditions. CSL (the incumbent TDMA licensee) said the under-utilization of the frequency allocations for its TDMA service was beyond its control and it did not support the re-allocation of the spectrum to other contenders. Instead, CSL suggested swapping its assigned frequency spectrum for the EGSM spectrum in the range of 882.5 - 890 MHz / 927.5 - 935 MHz so that it might expand the network capacity of its GSM and PCS services.

24. Other respondents supported TA's proposal. NWPCS, Peoples and SMC supported the proposal not to grant the right to the CDMA and the TDMA licensees. HKBN supported the redeployment of the under-utilized 800 MHz band. ACC, CDG, CG of Canada, CUIL, CUL, Mr Joseph Tsui, Lucent and Qualcomm all urged the TA to consider introducing new licences in the 800 MHz band so that mobile services using the cdma2000 technology could be deployed in Hong Kong.

25. Radio spectrum is a scarce public resource. The TA has the statutory duty under section 32G of the Telecommunications Ordinance to promote the efficient allocation and use of such a resource. As such, in determining the licensing arrangement, the TA is of the view that promotion of efficient use of the radio spectrum is an important consideration. In granting the "right of first refusal", the TA is minded to take into account whether the existing licensee has achieved efficient use of the scarce public resource during the tenure of its licence. According to the statistics, in stark contrast with the continuous growth of the GSM and PCS services, the number of subscribers of the CDMA and TDMA services has been declining steadily over the years. For the CDMA

network, the number of subscribers fell from 280,000 in year 2000 to around 40,000 in year 2003 whereas for the TDMA network, the figure fell from 140,000 to around 30,000. If this trend continues, it is expected that around the expiry dates of the licences in 2005, the number of subscribers of CDMA and TDMA services would further shrink to a very low level. Moreover, the number of installed CDMA base stations dropped from about 460 in year 2000 to about 300 in year 2003. For the TDMA network, the figure is even more startling, dropping from 400 to around 50 over the same period. For comparison, the average number of installed base stations by the GSM licensees operating in the 900 MHz band is generally in excess of 1,000.

26. The TA is therefore of the view that the CDMA and the TDMA licensees have not achieved efficient use of the scarce spectrum resource. As such, the TA is of the view that for better utilization of the spectrum which will in turn benefit the community at large, **the CDMA and the TDMA licensees should not be entitled to the "right of first refusal". Upon the expiry of their licences, the CDMA and TDMA licensees should be required to vacate the frequency spectrum that they are currently assigned.**

Orderly Migration of Existing Customers

27. The statistics given in paragraph 25 indicate that about 70,000 customers may be affected if the CDMA and TDMA incumbent licensees do not have their licences renewed. In fact, the number of customers of the CDMA and TDMA incumbent licensees continues to decline. Since the two licensees have not been actively marketing their services in recent years, customers should have acquired their mobile handsets for quite some time. In addition, each of the CDMA and the TDMA licensees also holds a GSM licence and a PCS licence, to which they are entitled to exercise their "right of first refusal". By giving sufficient advance notice, the TA considers that these two licensees should have little difficulty in devising a smooth "migration" arrangement for these customers by migrating them to their GSM or PCS networks, as they have attracted their CDMA or TDMA customers to subscribe to their GSM or PCS services over the years. Any disruption that may be caused to the customers should be minimal.

Assignment of Vacated Frequency Spectrum

28. Upon the expiry of the CDMA and TDMA licences on 19 November 2005 and 22 July 2005 respectively, the relevant frequency spectrum assigned to the two incumbent operators will become vacant. We will discuss in the following paragraphs how the TA intends to re-farm and re-distribute the vacated frequency spectrum.

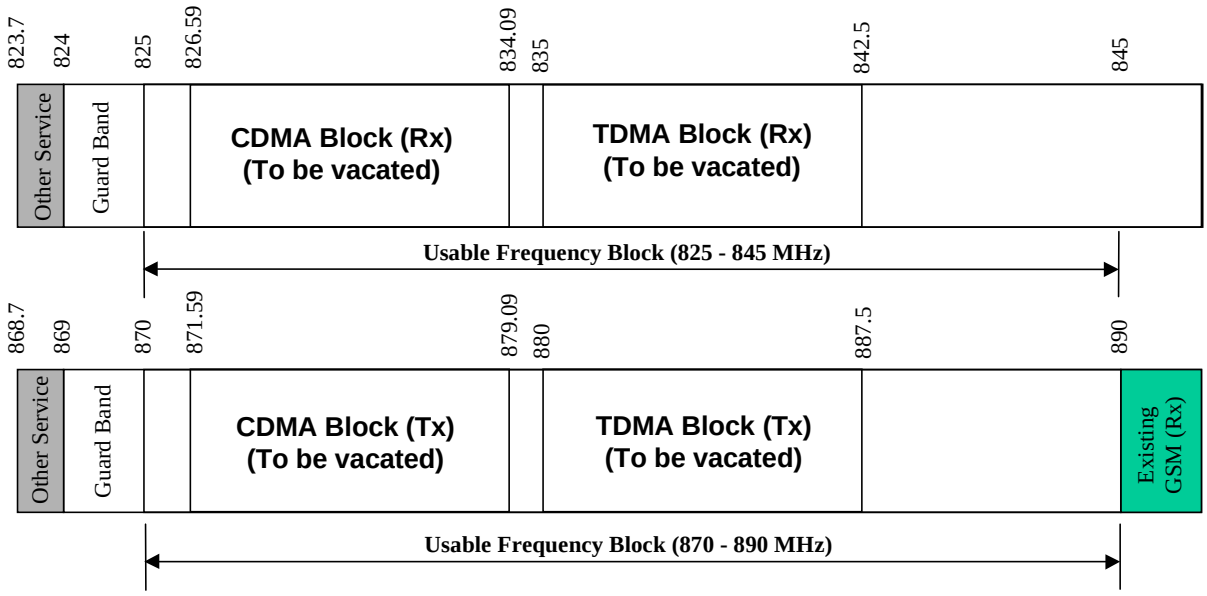
FREQUENCY SPECTRUM AVAILABILITY AND LICENSING CONSIDERATIONS

Vacated Frequency Allocations in 800 MHz

29. A number of respondents urged the TA to introduce new licences that would facilitate the deployment of mobile services based on the cdma2000 standard. They opined that since such services have been gaining popularity in North America and some places in Asia, cost effective roaming services should be provided for visitors coming from these regions. These CDMA advocates, including CDG, CUL, HKBN, Lucent, Nortel and Qualcomm, suggested that the TA should deploy the vacated spectrum for cdma2000, but not the GSM standard in the Extended GSM (EGSM) band.

30. Ericsson advised that certain bandwidth in the EGSM band could be allocated to the existing 2G mobile operators. NWPCS and Peoples further suggested that the EGSM band should be allocated to the PCS licensees for capacity expansion. There was a general consensus that the TA should not allow the deployment of GSM 850 system, given its relatively low popularity in places other than the North America.

31. The existing frequency allocations in the 800 MHz band for the CDMA and TDMA licences lie in the range of 826.59 - 842.5 MHz / 871.59 - 887.5 MHz. Taking into account the guard band requirement with the services occupying the neighbouring frequency bands, the lower limits of the usable frequency blocks can be pushed downward by a further 1.59 MHz to 825 MHz and 870 MHz respectively. As a result, the usable frequency block that can be re-farmed (after vacating the CDMA and TDMA frequency spectrum) lies in the range 825 - 845 MHz / 870 - 890 MHz (please refer to Figure 1).



Legend: "Rx" refers to the receiving frequencies of the base stations

"Tx" refers to the transmitting frequencies of the base stations

Figure 1:- The Usable Frequency Block After Vacating the Existing CDMA and TDMA Assignments

32. As mentioned in paragraph 9, the TA will maintain a technology-neutral approach in the licensing of mobile services and the TA has all along been relying on market force to decide on the technology to be adopted. Nevertheless, the TA is aware of the practical constraints imposed by the availability of commercial equipment in the relevant frequency bands and also the need to align the band plan with the one in force across the boundary in Mainland China.

Band Plan in Mainland China

33. The band 825 - 835 MHz / 870 - 880 MHz is assigned for cdma2000 service in the Mainland. While the band 885 - 890 MHz / 930 - 935 MHz is assigned for GSM service in the Mainland, services have not been deployed in the Shenzhen Special Economic Zone using this band. This is to avoid interference with the legacy TDMA network operating in Hong Kong. The TA is mindful that the future 800 MHz band plan in Hong Kong should be compatible with that of Mainland so as to maximize the utilization of the scarce public resource on both sides of the boundary. An aligned band plan between

Hong Kong and the Mainland will also facilitate the provision of automatic roaming services between the two places. As a result, the TA intends to align the local 800 MHz frequency band plan with the Mainland band plan. This would imply that the lower portion of the usable frequency block will be deployed for systems conforming with the cdma2000 standards while the upper portion of the relevant frequency block will be deployed for systems conforming with the GSM standard.

34. Figure 2 illustrates the proposed new band plan for the 800 MHz band. The lower portion of the usable frequency block is denoted as *Block A* whereas the upper portion of the usable frequency block is denoted as *Block B*.

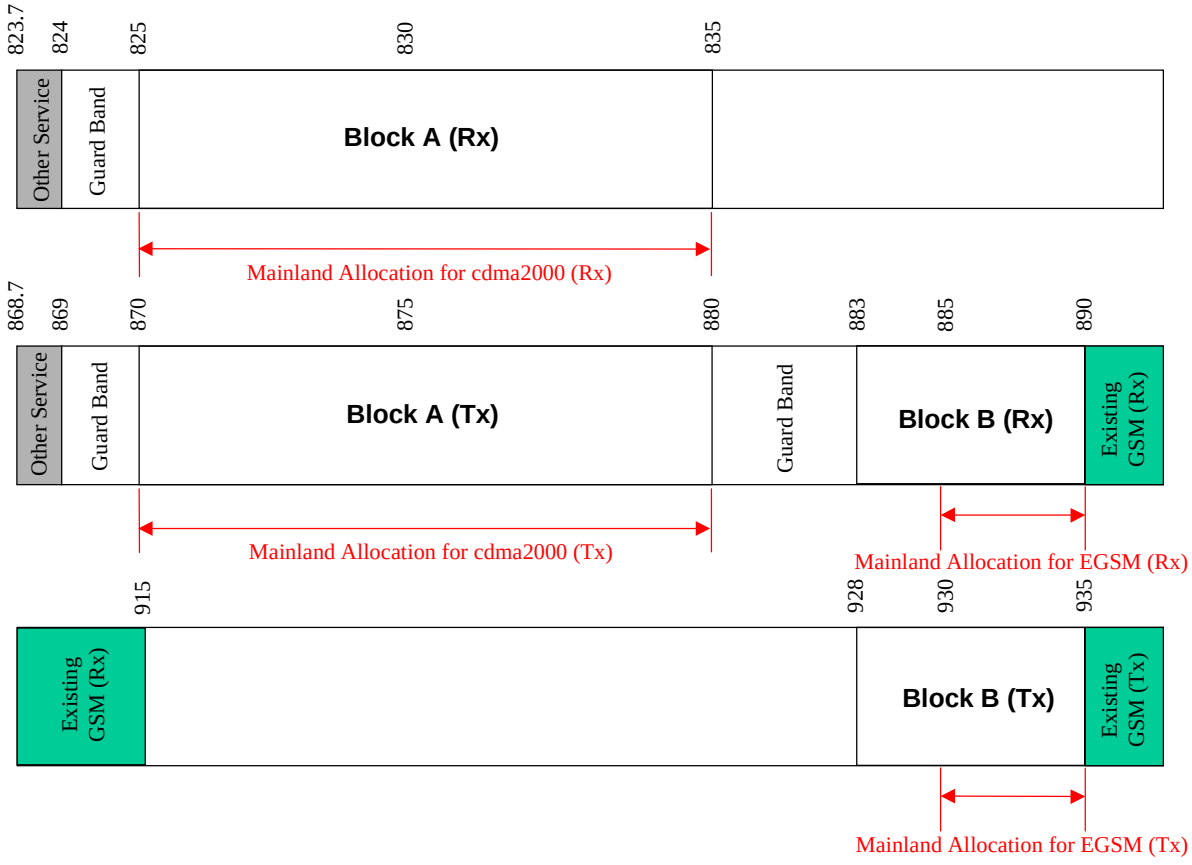


Figure 2 Proposed 800 MHz Band Plan for Hong Kong

35. As advised by Ericsson and SMC in their submissions, a guard band of 3 MHz should be sufficient if cdma2000 system was to be deployed adjacent to the GSM system. Therefore, the band edges of *Block A* and *Block B* can be flexibly adjusted to maintain a guard band of 3 MHz. If the lower edges of

Block B are adjusted upwards to align with those in the Mainland band plan, then we should be able to cultivate an addition of 2 x 2 MHz in the 800 MHz band for *Block A.*

ISSUE ONE NEW MOBILE LICENCE EMPLOYING *BLOCK A* IN THE 800 MHz BAND

Possible Use of *Block A*

36. *Block A* can support the provision of quality mobile data services if the cdma2000 standard is to be deployed. The TA notes that the cdma2000 standard is developing fast in North America, South Korea, Japan and other countries and that the standard cdma2000 1x EV-DO, which is capable of supporting a maximum user data rate of 2.4 Mbps, uplink and downlink, has been launched with commercial success. At end of year 2003, cdma2000 1x EV-DO services have attracted more than 4 million customers while cdma2000 1x services have 75 million customers in 35 countries. A wide range of consumer mobile phones and devices supporting the standard is also available in the market. The experience of these overseas mobile markets indicates that the standard will enable the provision of a wide range of advanced mobile data services supporting innovative value-added applications.

37. The TA notes that *Block A* can also be used for deploying other technology as well, notably the GSM 850 standard. Some mobile operators in the North America have announced plans to migrate their legacy TDMA systems operating in the 800 MHz band to the GSM 850 standard. However, the deployment of GSM 850 is still at the early stage. It is noted that GSM 850 differs from the conventional GSM 900 standard only in the operating frequency band and it provides features similar to the existing GSM systems in Hong Kong. Most of the GSM 850 handsets will be dedicated to the American market and dual band handsets will mostly cover the North American 850 MHz/1900 MHz bands. Therefore, the TA doubts the feasibility of implementing GSM 850 standard in Hong Kong given that there are uncertainties on whether the technology can meet the requirement of providing quality mobile data services and on whether suitable equipment will be available for the Hong Kong market.

Impact of Making Available *Block A* for Licensing on the Mobile Market

38. If *Block A* is made available for licensing, the TA sees opportunity for the introduction of various advanced and innovative mobile data services supported by the cdma2000 standard, which is currently not adopted by mobile operators in Hong Kong. Consumers in Hong Kong will be able to enjoy

services similar to those that have become successful and popular in places like Japan and South Korea, but are not available from existing operators in Hong Kong. This will increase the choice of advanced mobile services for consumers.

39. The TA is mindful of the concern that the introduction of a new licensee may intensify competition, especially in the 3G services market. The TA wishes to make it clear that if *Block A* is to be made available for issuing a new licence, the objective would be to enable the introduction of advanced and innovative mobile services to benefit consumers, spawn new industries and enhance Hong Kong's status as a mobile services hub in Asia.

40. The new mobile licence to be issued will therefore carry more stringent licence conditions, especially on quality and variety of services. Parties interested in applying for the new licence would recognize that in order to make a viable business case, product differentiation via innovative data, content and application services would be crucial. The TA envisages that introduction of the new licence may change consumers' usage pattern of and enhance demand for mobile data services. This would give impetus to competitors to invest further in services as well as research and development to improve their service quality and variety rather than by cutting prices in the conventional voice services. In the end, the revenue potential of the market would be expanded to the benefit of all players.

Recommendation

41. Taking the factors in paragraphs 38 to 40 into account, the TA intends to make available *Block A* for licensing, with stringent conditions on quality and variety of services to pave the way for new and expanded services to be formulated. This will achieve the objective of promoting innovation, spawning new industries and enhancing Hong Kong's status as a mobile services hub in Asia.

42. Given that the TA has adopted a technology-neutral approach in the issue of new licence, the TA will not mandate the new licensee to adopt the cdma2000 standard. However, if the new licensee decides to implement other standards like GSM 850, the new licensee should bear in mind that the new licence conditions on mobile data service will still be enforced. Furthermore,

the new licensee should also be prepared to take measures to tackle the potential interference problems with the systems operating at the same frequency band in the Mainland.

43. In determining the amount of bandwidth required by the new licensee, the TA notes that the cdma2000 standard can achieve high spectral efficiency and 2 x 10 MHz in the 800 MHz band should be sufficient for the new licensee to implement quality mobile services in Hong Kong. According to the cdma2000 standard, the bandwidth of each carrier is 1.25 MHz. The new licensee will be able to flexibly allocate the available carriers for either voice or data services. Nevertheless, the new licensee may still want to adopt other technology instead of cdma2000 according to its own commercial decision. As far as efficient use of frequency spectrum is concerned, the TA is of the view that the new licensee should make full use of what the latest mobile technology can offer and should adopt technology with high spectral efficiency. As a result, the TA considers that **a bandwidth of 2 x 10 MHz should be sufficient for the new licensee**. ***Block A* (825 - 835 MHz / 870 - 880 MHz) should be offered to the new entrant in the upcoming licence application exercise**. **New licence conditions requiring the licensee to provide quality mobile data service and coverage commitments will be imposed.** The new licence conditions applicable to the new licensee will be discussed in subsequent sections of this document.

RESERVE *BLOCK B* FOR FUTURE USE

44. To allow for a 3 MHz guard band with *Block A*, *Block B* should lie in the range 883 - 890 MHz / 928 - 935 MHz. One option is to allocate *Block B* to a new entrant deploying the EGSM standard. In that case, the service offered by this new entrant will only replicate the 2G mobile services provided by the incumbent GSM and PCS licensees and this will not be conducive to the development of innovative services in Hong Kong.

45. A better option is to reserve the spectrum for future assignment to the incumbent GSM and PCS licensees. As described in paragraph 21 above, when the incumbent licensees in future wish to deploy advanced mobile services in the existing 2G spectrum, contiguous frequency allocations in multiple of 2 x 5 MHz may be needed. In that case, *Block B* can be reserved as seed spectrum for the future rationalization of the frequency allocations to the GSM and PCS licensees. As the transmission equipment and handsets operating in this block are readily available, *Block B* represents a very attractive candidate band for the seed spectrum. Moreover, subject to the future needs of the incumbent operators, the block can also be allocated to the qualified incumbent operators for capacity expansion in accordance with certain criteria to be prescribed by the TA.

46. After careful considerations, **the TA proposes to reserve *Block B* for the future expansion and frequency rationalization of the incumbent GSM and PCS operators. Figure 3 sets out the proposal of the TA regarding the future band plan for the 800 MHz band.**

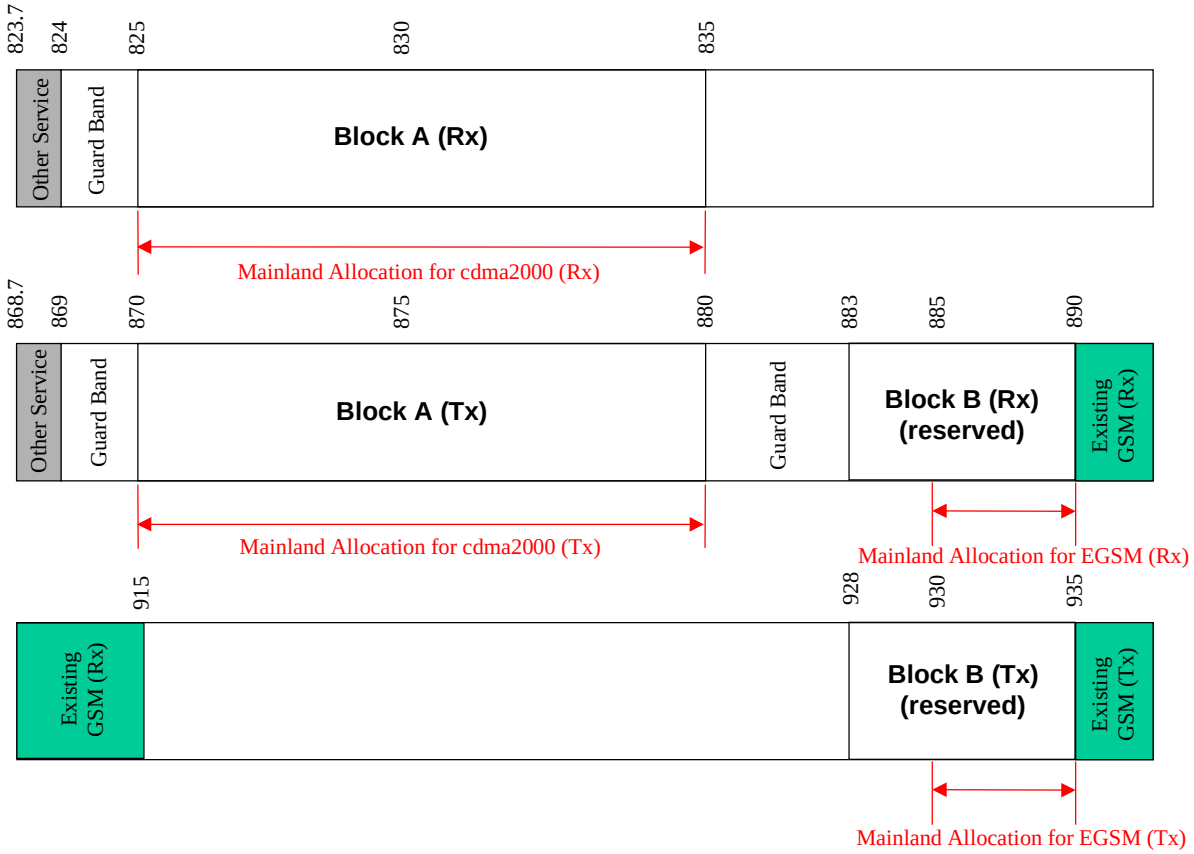


Figure 3 Proposed Frequency Allocations in the 800 MHz Band for Hong Kong

OTHER AVAILABLE SPECTRUM IDENTIFIED IN THE FIRST CONSULTATION PAPER

Unallocated PCS Frequency Spectrum

47. In their submissions to the First Consultation Paper, Ericsson and Peoples requested the allocation of the remaining 2 x 4.9 MHz, i.e. 1780.1 - 1785 MHz / 1875.1 - 1880 MHz, in the PCS band to the mobile operators if there was a demonstrated need. According to the TA Statement entitled "Assignment of the Unused Spectrum in the 800 - 900 MHz and 1700 - 1900 MHz Bands to the Operators of PMRS and PCS Mobile Networks" dated 1 March 2002, the said frequency band is reserved for special purpose and is not available for assignment. **The TA now forms the view that the relevant frequency spectrum should be reserved, in a similar manner to *Block B*, for the future expansion and frequency rationalization of the incumbent GSM and PCS licensees.**

Unallocated TDD Frequency Spectrum

48. As described in the First Consultation Paper, the frequency bands from 1900 - 1904.9 MHz[2] and 2010 - 2019.7 MHz have been designated for use by 3G Time Division Duplex (TDD) systems but they have not yet been assigned to any operator for such a deployment. At present, there is no clear consensus as to how the frequency bands should be used. While many administrations (including Hong Kong) have licensed 3G services in the TDD spectrum, the licensees have yet to decide how to make use of the spectrum.

49. Some equipment vendors advocate the use of the TDD band for providing broadband Internet access service. Commercial products based on certain proprietary standards are currently available. The service, however, is more akin to broadband wireless local loop service providing portable Internet connectivity rather than a full-fledged mobile service. There is not yet any large-scale deployment of services in this band around the world.

50. The application for the TDD spectrum is still evolving and the relevant technical standards are not mature yet. **The TA considers it prudent not to assign the unallocated TDD spectrum at the present moment.** The TA

[2] Part of this frequency band is allocated for the use of the PHS equipment, which is exempt from licensing.

understands that frequency bands other than the 3G TDD spectrum (such as the 3.5 GHz band) have been deployed in other countries for broadband wireless local loop services. The TA is ready to consider the licensing of broadband wireless access service in the 3.5 GHz band. Interested parties are welcome to apply direct to the TA but this will be dealt with as a separate exercise.

Other Available Frequency Spectrum

51. The First Consultation Paper also invited comments from the industry on the use of the following spectrum which has been allocated by the ITU for 3G services.

- 1980 - 2010 MHz / 2170 - 2200 MHz, and
- 2500 - 2690 MHz

52. In response, NWPCS commented that the band 1980 - 2010 MHz / 2170 - 2200 MHz had been reserved as satellite component of the 3G systems in other countries. Roaming problems would exist if the band was used for terrestrial service in Hong Kong. Motorola advised that the utilization of 2500 - 2690 MHz would be considered in the coming ITU World Radiocommunications Conference to be held in 2007. The TA agrees that the two frequency bands are not ready for assignment and **therefore proposes that these frequency bands should be kept in reserve.**

METHOD OF AWARDING THE NEW LICENCE FOR *BLOCK A*

53. In the last 3G licensing exercise conducted in 2001, a hybrid auction consisting of pre-qualification and spectrum auction was used to award the four 3G licences. The auction was conducted based on a royalty auction with guaranteed minimum payment. The bidders bid on the percentage of Network Turnover, subjected to a Minimum Annual Payment irrespective of the actual turnover. If the turnover grew to a point that the royalty calculated using the percentage bid in the auction exceeded the minimum payment, the successful bidder would need to pay the additional royalty over and above that of the minimum payment.

54. Considerations to apply the same method in awarding the new licence for *Block A* remain valid. The advantages of the hybrid royalty auction, as previously identified, are as follows:-

- It ensures the quality of the new mobile service network as all qualified applicants should be able to finance, construct and operate a mobile service network.
- The spectrum auctioning process is a fair and efficient method to allocate spectrum to the applicants with the best business case.
- It is "pro-entry" by lowering the financial burden of successful 3G licensees, and allows the Government to share the upside of the future 3G services market.
- The guaranteed, minimum royalty payment requirement will minimize credit risks for the Government, and reduce the costs that may be passed on to consumers.
- The design of rising minimum guaranteed payments will deter stronger bidders from overbidding in the hope that it can pass royalties on to consumers. At the same time, weak players should be deterred from making over-aggressive bids on royalty percentages.

55. The TA has reviewed the latest economic and market situation, and he is of the view that the above-mentioned advantages identified with the hybrid royalty auction remain valid. Adopting the same method to award the new

licence would result in a level playing field between the 3G licensees and the new entrant. The economic benefits accrued to the community would also be optimized as a whole. Therefore, for the proposed licensing of *Block A* , **the TA intends to adopt an approach similar to the one adopted in 2001 for the 3G licensing exercise.**

Auction Process

56. The auction process will generally follow that of the last 3G licensing and consist of the following stages:-

Stage 1 - Pre-Qualification

57. Applicants will be required to submit certain information for the assessment of the TA in order to proceed to the next round of the licensing process. Similar to the 3G exercise, the pre-qualification criteria are intended to be relatively light but should involve setting certain minimum criteria on investment, network rollout, financial capability etc. to ensure the quality of the new mobile network. This pre-qualification process would require the applicants fulfilling the following minimum requirements:-

- Submission of a detailed statement which substantiates the bidder's financial and technical capability to roll out and operate a mobile service network in Hong Kong;

- Provision of financial guarantees to ensure that the capital required to support these minimum rollout conditions will be provided; and

- Lodging with the government of a specified amount of deposit which may be forfeited if the bidder violates the bidding rules or fails to take up the licence after winning the auction.

Stage 2 - Auction

58. Pre-qualified applicants will then participate in an auction and bid for the new licence for *Block A.* Detailed designs of the auction process will be announced nearer the time, but the current thinking of the TA is to conduct a simple single-round sealed bid auction.

59. As the new licence for *Block A* would in effect be providing 3G services, a licence condition on the payment of Spectrum Utilization Fee (SUF) would be imposed on the new licensee. The structure for the SUF will follow that of the existing 3G licensees. The Government will set the Reserve Price, and the award price will be set by the successful bidder having the best business case. The SUF will be payable by the end of each licence year, which is similar to the 3G licensees.

Eligibility of Incumbents

60. Another issue to be considered is whether the incumbent 2G operators should be allowed to bid for the new licence operating in *Block A*. If the incumbent operators are allowed to bid, potentially there will be more bidders participating in the licensing exercise. This will help to ensure that the auction result will reflect the true market value of the frequency spectrum to be assigned. As the new licensee will be required to pay SUF, to meet certain milestones and to lodge performance bonds with the TA, it is expected that the successful bidder will fully utilize the frequency spectrum to maximize the return on his investment. **The TA therefore proposes that the incumbent 2G operators should be allowed to participate in the licensing exercise for *Block A***.

PAYMENT OF SPECTRUM UTILIZATION FEE (SUF) FOR GSM/PCS LICENCES

Whether SUF Should be Imposed?

61. CSL submitted that SUF should not be imposed as it was onerous and would undermine incentives to invest. SUF should be imposed only on 3G services but not on 2G services. If SUF was to be imposed on 2G services, the fee structure should be aligned with the existing 3G licences. CSL also suggested specifying a cut-off date for imposing SUF, say end of 2009, to avoid the difficulties in distinguishing 2G and 3G services. SUNDAY considered it inappropriate to levy the same level of 3G's SUF on the 2G licensees for the purpose of maintaining a level playing field, and that the cost would eventually be passed onto the consumers. They considered that licensees should not be required to pay SUF as long as they still offered 2G services. NWPCS said that it was unfair to levy SUF on 2G services. Peoples also advised against levying SUF on licensees providing primarily non-3G services. CUIL advised that SUF should only be imposed on 3G services and that SUF should not be required for licensees not offering 3G services. Ericsson said that, since SUF was previously levied on 3G services, SUF should also be applicable to similar 3G services regardless of frequency or technology adopted in future. However, a clear definition of 3G services would be required. SMC advised that there were difficulties in analysing different options of SUF unless a definition of 3G services and the future licensing arrangements were made clear.

62. The Consumer Council and WT&T considered that it would be unfair to the existing 3G licensees if the incumbent 2G licensees were not required to pay SUF for their new licences since they could also provide 3G services. PCCW-HKT and HKBN urged the imposition of SUF to the 2G licensees, arguing that the SUF should not be linked to any specific technology or usage.

Level of SUF

63. CSL suggested fixing the royalty percentage at 5% of the network turnover. Otherwise, a fixed fee per MHz would be preferred. SUNDAY advised that when licensees began to offer 3G services, they should pay the same level of SUF as the 3G licensees. If any licensees acquired additional

spectrum for 3G, they should pay a 3G entry SUF which would be the cumulative amount of SUF already paid by the existing 3G licensees.

64. NWPCS disagreed with the proposed calculation method of SUF based on royalty percentage over network turnover. Instead they considered that the amount of SUF should depend on the amount of spectrum allocated. They also held the view that there should not be any minimum charge of SUF. HKBN and Peoples shared similar views that SUF, if levied, should be directly proportional to the amount of spectrum used by the licensee to provide 3G services.

65. The Consumer Council advised that it was not necessary to require the new licensees to pay the same level of SUF as the existing 3G licensees, since different technologies would provide different kinds of services.

Timing of Making SUF Payment

66. CSL suggested specifying a cut-off date, say by the end of 2009, to avoid the difficulties in distinguishing 2G and 3G services. The Consumer Council also agreed that a specified cut-off date should be applied as from which 3G services were expected to be provided. This would encourage licensees to better utilize the spectrum in migrating to 3G services.

67. On the other hand, SUNDAY said that there should not be a specified cut-off date from which 3G services were expected to be provided by the licensees. Peoples also advised against presetting such cut-off date. The fee should only be triggered upon the occurrence of a milestone when the new licensees offered 3G services. NWPCS went further and disagreed that SUF should be applied to both 2G and 3G services after a cut-off date or after the occurrence of any event. SUF should not be applied to 2G services and should only be levied if additional spectrum was allocated and 3G services were deployed.

Proposed SUF Payment for the GSM/PCS Licences

68. Taking into account the comments made by the respondents, the TA maintains that 2G licensees should be required to pay SUF as they too, like the 3G licensees, make use for business of spectrum, which is a scarce public

resource. The question is therefore how we should implement the SUF arrangement. There are a number of factors that need to be taken into consideration.

69. In the short term, the existing licensees will likely to continue to offer 2G services (including 2.5G and 2.75G services) after the issue of the new licences. As such, any requirement to immediately levy an SUF (a new cost element) with a fee level and structure similar to the existing 3G licensees could impose a substantial financial burden on the licensees. This could have considerable impact on the cost structure of the 2G licensees. We would wish to minimize this impact as otherwise this would increase the cost of business quite abruptly and as the licensees might choose to pass the additional cost to customers resulting in higher retail prices, and/or restrain their new investments otherwise incurred for the development of new technology or innovative services. The TA therefore believes that initially there is a case for setting SUF for 2G licensees according to a structure different from that for 3G licensees.

70. However in the longer term there should be convergence of the two structures on principle and parity grounds. The TA proposes that the right time to remove the differential treatment should be 1 January 2010. Firstly, the transitional period will give sufficient time for the 2G licensees to factor the SUF fully in their cost structures. Secondly, the difference in capability between 2G licensees and 3G licensees would diminish within the next few years as the former could make use of the assigned spectrum to operate innovative data and multimedia services similar to 3G, due to network upgrading or availability of 3G equipment to operate in the 2G spectrum. Thirdly, the anticipation of SUF convergence will also send a clear message to 2G licensees for them to review their future business strategy and encourage their migration to higher network capacity, higher value added services and hence higher revenue sources to justify the converged SUF.

APPLICABLE LICENCE CONDITIONS

71. The mobile carrier licences will be awarded to both the existing GSM and PCS licensees who have accepted the “right of first refusal” and the new licensee who has won the auction for *Block A.* These licensees will be required to comply with certain specific licence conditions. For obvious reasons, the

new licences will include licence conditions found in the existing 3G licences, including but not limited to:

- Accounting separation
- Anti-Avoidance Provisions
- Directory Services
- Disposal of Assets
- Emergency Service
- Location Service
- Metering Accuracy
- Numbering Plan and Number Portability
- Requirements for Interconnection
- Tariffs

As the new licensee operating in *Block A* will be required to develop a brand new mobile network, additional licence conditions will have to be imposed on it. The following sections will discuss certain licence conditions on which the TA would invite views and comments of the industry and other interested parties.

LICENCE CONDITIONS APPLICABLE TO ALL LICENCES

30% Open Network Access (ONA) Requirement

72. In the First Consultation Paper, the TA opined that it was essential to continue to provide an open environment for access by content providers to future mobile networks and that this condition should apply to all licensees.

73. CSL questioned the need for the ONA requirement to the 2G operators given that there were difficulties for the existing 2G networks to release the required capacity and that the existing commercial negotiation between the 2G operators and MVNO had been effective. SMC objected to the ONA requirement on grounds of difficulty in measuring and making available 30% capacity. Peoples said that it was impossible for existing PCS licensees to open up at least 30% of the network capacity. PCCW-HKT advised that market force should be relied upon to determine the level of capacity provided to MVNOs. NWPCS said the requirement should only be imposed on the 3G services provided by the licensees. WT&T, however, supported the imposition of the ONA requirement on all the new licensees.

74. The TA would like to recapitulate that the ONA requirement was previously introduced in the last 3G licensing exercise in order to meet the government policy objective of introducing more competition at the content and service application level. Such an arrangement should greatly benefit the development of innovative, small and medium sized application houses and service providers in Hong Kong.

75. The TA believes that the same policy objectives shall be pursued in the impending licensing exercise. These objectives are important in enhancing Hong Kong's position as a mobile services hub in the region. In addition, it is also necessary to maintain a level playing field among the GSM and PCS licensees, the new licensee of the vacated *Block A*, and the 3G licensees which are subject to the ONA requirement. In view of these, the TA maintains that the same 30% ONA requirement should be required.

76. For the new licensee, the TA intends to apply the ONA requirement upon the grant of the new licence. This is in line with the last 3G licensing exercise. For those GSM and PCS licensees taking up the "right of first

refusal", the TA intends to apply the ONA requirement at a certain specified date from which 3G services are expected to be provided. On one hand, it can address the operators' concern about the difficulties in releasing sufficient network capacity to meet the ONA requirement. On the other hand, it can help to encourage the licensees to better utilize the spectrum and to migrate to the more advanced 3G technologies. The TA proposes to align the ONA date with the SUF cut-off date i.e. **1 January 2010**.

77. To conclude, **the TA intends to impose the ONA obligation on all new mobile carrier licences requiring the licensees to open 30% of their network capacity to the non-affiliated service providers. For those GSM and PCS licensees who exercise the "right of first refusal", the ONA requirement will be applied at a specified date which is proposed to be 1 January 2010. For the new licensee operating in *Block A*, the ONA requirement will be applied upon the grant of the licence.** Details of the ONA requirement will follow those of the existing 3G licensees. The TA would like to invite comments from the industry on the proposed arrangement.

Obligation to Provide Coverage to Specified Locations

78. In response to the proposed licence condition, CSL and SMC opposed to the imposition of the obligation to provide coverage to specified locations. SMC pointed out that the mobile licensees had no statutory right of access to land or entitlement for compensation for Universal Service Obligation. NWPCS and Peoples advised that there were technical concerns and financial burdens stemming from the proposal. SUNDAY said that the provision of coverage to the specified locations should only be made when compensation was provided. PCCW-HKT also said that it was unnecessary to impose the coverage requirement. WT&T proposed that compensation to the operators could be made through the existing Universal Service Contribution mechanism. Nevertheless, the Consumer Council and KCRC welcomed the proposal.

79. The TA is aware of the difficulties raised by the respondents. **The TA is therefore inclined to withdraw the proposal to oblige licensees to provide coverage to specified locations.** Nonetheless, the new entrant operating in *Block A* will still be required to commit to certain minimum coverage, including road tunnels and major transport systems. In the pre-qualification stage of the

licensing process, applicants will be required to commit to certain coverage requirements.

Provision of Cell Broadcast Service (CBS) / Multimedia Broadcast Multicast Service (MBMS)

80. CSL, NWPCS and SMC responded that the provision of CBS should be a commercial decision and therefore objected to the use of CBS for the dissemination of public announcements. Motorola also advised that CBS should be provided on a commercial basis, rather than being mandated through a regulatory requirement. The TA agrees with the respondents that the provision of CBS or MBMS should be a commercial decision of individual operators. **He therefore agrees to withdraw the proposal to mandate the provision of CBS or MBMS by the licensees.**

Compliance with Mandatory Codes of Practice

81. The First Consultation Paper outlined the TA's consideration on the issue of mandatory Codes of Practice (CoP) to regulate certain aspects of the operation or conduct of the operators. Certain examples of the proposed mandatory CoP including the CoP on mobile service contract and the CoP on the protection of customer information were given in the First Consultation Paper. The views and comments submitted by the respondents are summarized as follows:-

Code of Practice on Mobile Service Contract

82. CSL and SUNDAY requested the supporting evidence for making this Code mandatory. If there were real concerns, suitable legislation should be enacted by the Government, instead of regulating through a Code. SUNDAY further advised that it was not reasonable to mandate the Code only based on the amount of received customer complaints. NWPCS believed that the current voluntary compliance with the Code was working well and there was no need to stipulate a mandatory Code. PCCW-HKT, Peoples and SMC did not support the mandatory compliance to the Code and advised that Code should be established either on a voluntary basis or through industry consultation. Nevertheless, the Consumer Council welcomed the proposal.

Code of Practice on Protection of Customer Information

83. CSL and SUNDAY considered the requirement unnecessary and unjustified as it would lay down further obligations beyond the statutory requirement stipulated in Personal Data (Privacy) Ordinance. NWPCS again believed that the current voluntary compliance with the CoP was working well and there was no need to stipulate a mandatory CoP. PCCW-HKT, Peoples and SMC did not support the mandatory compliance to the CoP and advised that the CoP should be established either on a voluntary basis or through industry consultation. However, the Consumer Council welcomed the proposal.

Recommendation

84. While the TA appreciates the concerns raised by the respondents, the TA wishes to point out that the current voluntary CoPs on mobile service contract and on protection of customer information were drawn up after industry and public consultation. Moreover, these CoPs have been in operation for a number of years and as such, the industry should be familiar with its operation. **The TA therefore maintains his views that the CoPs should be mandated in the new licences, and that he should have the power to require the licensees to comply with certain CoPs as and when necessary.** The TA is inclined to impose a special condition to the incumbent licensees as well as the new licensee such that the TA is empowered to require the licensees to comply with certain CoPs to be prescribed by the TA from time to time.

Quality of Service (QoS)

85. In addition, the TA would like to point out that the QoS requirement may be another applicable area for a mandatory CoP. The TA contemplates that this mandatory CoP should be imposed on all licensees such that they should publish comparable, adequate and up-to-date information for end customers on the quality of its services.

86. The QoS items which the TA has in mind include, amongst other things:-

- the QoS parameters to be measured;

- the content and form of the information to be published, and how the comparability of the information is to be validated. For the purposes of validation, the TA may require independent audit of the specified information;
- the manner of publication of the information;
- the timing of publication of the information; and/or
- the requirement for the licensees to provide the TA with a copy of the information to be published in advance of the publication.

The TA would like to invite comments on this proposal.

LICENCE CONDITIONS APPLICABLE TO NEW LICENCE ONLY

Performance Bond

87. In the First Consultation Paper, the TA asked whether performance bond would be required. CSL, NWPCS, Peoples and SUNDAY commented that the existing 2G licensees should not be required to provide performance bond as the existing licensees had already demonstrated good track record on their financial capabilities and the commitments to the mobile industry. CSL and PCCW-HKT shared the view that recent waiver granted to the 3G licensees undermined the need for the performance bond requirement. HKBN also opposed to the performance bond mechanism. However, WT&T supported the requirement.

88. The TA maintains that the performance bond mechanism has protected and will continue to protect the government against any plausible serious default by a licensee. The mechanism is necessary for the new licensee as it represents the commitment of the new licensee to comply with the licence conditions and to develop its network and services expeditiously. Therefore, **the TA considers that it is important to maintain the performance bond requirement for the new licensee.** Similar to the 3G licensing regime, the new licensee will be required to lodge a performance bond with the administration to guarantee the payment of SUF for the upcoming five years.

89. Nevertheless, the TA acknowledges that the existing GSM and PCS licensees who are eligible for the "right of first refusal" have already provided proven mobile services with satisfactory coverage. They have a solid on-going business with a wide customer base. The need for the performance bond may not be imperative as compared with the new licensee. **The TA therefore considers that the performance bond requirement should not be imposed on the existing GSM and PCS licensees who exercise the "right of first refusal"**.

Minimum Network Capacity for Mobile Data Service

90. As discussed in the preceding paragraphs, the decision to make available *Block A* for licensing to a new entrant is based on the premise that new mobile data service will be provided so as to stimulate the development of an advanced mobile market in Hong Kong. Hence, the TA considers it necessary

to impose new licence conditions on the new licence with regard to the provision of mobile data service. **The TA proposes that suitable targets be specified in licence conditions to correspond to an active level of mobile data usage.** These targets will be specified in terms of, for example, a percentage (e.g. 25% or 50%) of its network capacity to be dedicated to mobile data services, a percentage of user revenue to be derived from mobile data usage, average volume of data usage by users, or other suitable parameters. Views and comments are welcome on this proposal and the appropriate parameters to be specified.

More Stringent Network Rollout and Geographic Coverage Requirements

91. To ensure that the new licensee will develop its network expeditiously with satisfactory coverage to its subscribers, the TA is prepared to impose a new licence condition to require the licensee to provide its network and services to cover at least 50% of population with a peak data rate per radio carrier of at least 2 Mbps in 3 years' time from the grant of licence. The new licensee will also be required to provide coverage at strategic locations, including tunnels and major transport systems like the MTRC and the KCRC railway systems.

92. During the auction of the new licence, the bidders are required to provide, among other things, a commitment of the network and service coverage in the pre-qualification stage. There will be a threshold test for qualifying bids before they are allowed to participate in the auction. The commitments made by the successful bidder will be incorporated into the new licence as one of the licence conditions.

SUMMARY OF PROPOSED LICENCE CONDITIONS

93. In order to give a clear picture on the applicability of the various proposed licence conditions, the following table is included for reference.

Proposed Licence Conditions	Applicability to the Existing GSM and PCS Licensees Accepting the "Right of First Refusal"	Applicability to the New Licensee of *Block A*
Performance Bond	x	✓
Minimum Network Capacity for Mobile Data Service	x	✓
Network Rollout and Geographical Coverage Requirement (including coverage obligation to specified locations)	x	✓
QoS Requirement	✓	✓
ONA Requirement	✓	✓
Code of Practice on Mobile Service Contract	✓	✓
Code of Practice on Protection of Customer Information	✓	✓
All Conditions in the 3G Licence	✓	✓
Cell Broadcast Service/Multimedia Broadcast Multicast Service	x	x

Table 1 Applicability of the Proposed Licence Conditions

INVITATION OF COMMENTS

94. Views and comments on this consultation paper should reach the Office of the Telecommunications Authority on or before **30 April 2004**. Any person who submits views and comments should note that the TA may publish all or any part of the submissions received and disclose the identity of the source in such manner as the TA sees fit. Any part of the submission which is considered commercially confidential should be clearly marked. The TA would take such markings into account in making his decision as to whether or not to disclose such information. Submission should be addressed to:-

Office of the Telecommunications Authority
29/F Wu Chung House
213 Queen's Road East
Wanchai
Hong Kong
Attention: Senior Telecommunications Engineer (Technical Regulation)2
Fax: 2803 5112
E-mail: 2g-consultation@ofta.gov.hk

An electronic copy of the submission should be provided by e-mail to the address indicated above.

Office of the Telecommunications Authority
19 March 2004