

Licensing of Spectrum in the 850 MHz Band to Enable the Provision of CDMA2000 Service

Consultation Paper

27 October 2006

INTRODUCTION

On 29 November 2004, the Telecommunications Authority (TA) issued the Statement entitled “Licensing of Mobile Services on Expiry of Existing Licences for Second Generation Mobile Services” announcing his decision concerning the licensing arrangement of the second generation (2G) mobile services upon expiry of the licences held by the incumbent licensees. In essence, the TA decided to grant the “right of first refusal” to the nine incumbent licensees providing 2G mobile services using the GSM¹ 900/1800 standards. Subsequently all licensees exercised the right and Mobile Carrier Licences with a term of 15 years were granted to them upon the expiry of their then existing licences.

2. At the same time, the TA decided that the “right of first refusal” would not be granted to the two licensees providing mobile services using the IS-95 CDMA² standard and IS-136 TDMA³ standard, on the ground that they did not make use of their assigned spectrum efficiently. Instead they were offered to retain one-third of the originally assigned spectrum for the purpose of subscriber migration over a period of 3 years. The licensee implementing the IS-136 TDMA standard (TDMA Licensee) did not take up the offer and surrendered its licence and all the assigned frequencies. Subsequently part of the frequencies that the TDMA Licensee had vacated (in the range of 840 - 842.5 MHz paired with 885 - 887.5 MHz) has been re-farmed for the EGSM⁴ service for the provision of mobile coverage in country parks.

3. As for the licensee implementing IS-95 CDMA standard (CDMA Licensee), its 3-year migration period will expire on 20 November 2008. It

¹ Global System for Mobile Communications.

² Code Division Multiple Access.

³ Time Division Multiple Access.

⁴ Extended Global System for Mobile Communications.

is necessary to review at this juncture the continual need of such a service in Hong Kong. Under section 32H(2) of the Telecommunications Ordinance, the TA may after consultation divide spectrum into bands and channels and specify the general purpose for which each band and each channel may be used. Accordingly, the TA would like to initiate this consultation to solicit views from the industry and other interested parties on the need to release spectrum to the market to enable the continuity of a CDMA mobile service.

4. For the avoidance of doubt, the preliminary views and the proposed approaches expressed in this paper in relation to various issues on the subject matter are solely for the purpose of consultation and do not represent the decision of the TA on the issues. Those issues remain to be the subject of consideration by the TA. Nothing in this paper shall be construed as indicating that the TA has formed any final opinion or decision on those issues.

THE SPECTRUM POLICY REVIEW

5. The Government is conducting a fundamental review of the spectrum policy with a view to formulating a responsive and transparent policy that will enable the community to reap maximum economic benefits from the deployment of frequency spectrum. For this purpose the Commerce, Industry and Technology Bureau (CITB) has issued a public consultation paper entitled “Consultation Paper on Proposed Spectrum Policy Framework” (SPR Consultation Paper) on 25 October 2006. A copy of the consultation paper may be downloaded from CITB’s home page at “www.citb.gov.hk/ctb”.

6. In the SPR Consultation Paper, the Government has comprehensively reviewed the current state of spectrum usage and considered the need for the promulgation of a revamped high-level spectrum policy framework. In particular, CITB has proposed in paragraph 31 of the SPR Consultation Paper a number of spectrum policy objectives to be adopted in Hong Kong. These policy objectives, if adopted, will serve as guiding strategies for the TA to follow in the management of the radio spectrum.

NEED FOR CONTINUITY OF THE CDMA SERVICE

7. In 2004, the TA considered that there was no urgency to introduce a new system to operate in the spectrum vacated by the IS-95 CDMA system and that determination on the allocation and assignment of the vacated and other spectrum could be deferred until the Spectrum Policy Review (SPR). In preparing for the SPR, the Government and the TA had held discussions with the industry. It transpires that the SPR will require careful study and analysis of all the implications stemming from a revised policy framework before finalisation, and this will likely be a long term process coupled with multiple implementation phases. Many of the related issues, such as secondary trading of spectrum and spectrum liberalisation, will need a thorough debate by the public and the industry before a consensus can be reached. Against such a background, the previous intention to withhold allocation and/or assignment of spectrum should be reviewed with the passage of time. Given the SPR will take time to proceed, the Government and the TA consider that allocation and/or assignment of spectrum should not be withheld altogether until the whole SPR exercise is completed. Any plan to release spectrum should be assessed and considered on a case-by-case basis as to whether it would promote the efficient use of the radio spectrum as a scarce public resource of Hong Kong.

8. Whereas the SPR is a long term process intended to formulate the future regulatory framework on the scarce public resource of radio frequency spectrum, the present consultation deals with an immediate concern i.e. the issue of releasing spectrum to enable the continuity of the CDMA mobile service. Policy evolution is necessarily a dynamic process to cope with technological, economic and market developments in order to promote public interest. Investors should reasonably expect that legitimate changes to existing policies are something which they have to face as the market evolves and when the existing policies are no longer suitable. To minimize regulatory uncertainty, it has been the practice of the Government and the TA to conduct transparent and thorough consultations prior to the making of any such policy changes. We believe this consultation would not illegitimately affect the SPR and it has satisfied the fairness requirements and safeguarded the interests of the public, the

industry and investors. The existing spectrum assignment for the provision of CDMA service will end in November 2008. It is therefore necessary to initiate consultation on whether there is a need to release spectrum to the market in order to enable the continuity of a CDMA mobile service.

LICENSING CONSIDERATIONS

Market Driven Approach

9. The Government has all along advocated the market driven/led approach. The TA will refrain from regulatory intervention so long as there is no market failure. In this exercise, the role of the TA is to make the spectrum available to the market, assign it in a fair, transparent and efficient manner and put in place the appropriate regulatory framework in a timely manner, so that continuity of the CDMA mobile service can be maintained.

10. The TA notes that there may be doubts on the business case of an additional player in the mobile market using the spectrum released. The TA considers that the questions on whether a new mobile player will be profitable and whether the CDMA mobile service will be successful in Hong Kong should be dealt with by the market itself. The best approach is to let the potential investors and market decide. The TA should not second guess the success or otherwise of any telecommunications service as the investors will carefully assess the market and the business opportunities when making investment decisions.

11. Some members of the industry may argue that a comprehensive cost-benefit (to the community) analysis has to be conducted before the TA decides whether the spectrum concerned should be released to the market. The TA considers that the principal benefit in releasing the spectrum which enables the provision of a CDMA mobile service after November 2008 is to maintain Hong Kong's strategic position as a world city and the gateway between the Mainland and the world. The TA will elaborate more on this benefit in paragraphs 13 - 19. As regards the costs to the community, the TA is aware of the arguments put forward in the 2004 consultation in

connection with the renewal of the 2G licences i.e. releasing the spectrum in November 2005 would impose costs to the community in the form of less investment in the 3G networks being, or yet to be, constructed and market fragmentation in the supply of content and applications over mobile services. The market has since moved on. WCDMA technologies have become mature. The four 3G networks based on WCDMA have been rolled out and three networks have been upgraded or are being upgraded to “High Speed Downlink Packet Access” (HSDPA) technologies. The 3G networks and services would become even more established by November 2008. Thus the cost arguments raised in 2004 would be irrelevant to this consultation. On the contrary, the additional investment opportunities and choice in the market are likely to bring more benefits to the community.

Assignment through Auction

12. Spectrum is a scarce public resource that should be utilised in the most efficient manner. It should be left for the market to decide who will be assigned the spectrum, and assignment by auction is generally considered to be the most appropriate means as it provides a fair, transparent, objective and economically efficient means to determine who should be assigned the spectrum. The TA does not see any reason why auction should not be used for the current case.

Enabling the Provision of the CDMA2000 Service in Hong Kong

13. The TA is mindful of the policy objectives proposed by CITB in its SPR Consultation Paper and is of the preliminary view that making spectrum available to the market for provision of CDMA services would advance the proposed policy objectives so far as they are applicable. It will facilitate introduction of advanced and innovative communications services in Hong Kong and strengthen our position as a telecommunications hub. It will also strengthen Hong Kong’s strategic position as a world city and the gateway between the Mainland of China and the world by facilitating the provision of key services in Hong Kong which are deployed, or will be deployed, globally or in the Mainland of China. Indeed, it is necessary to maintain compatibility of the telecommunications infrastructures and services with the Mainland of China and the world in order to ensure the availability of seamless roaming

telecommunications services for visitors while they are in Hong Kong and for our own consumers when they travel abroad. Efficient use of spectrum in such compatible infrastructures and services would attain benefits to the community.

14. For the case of 3G mobile service, there are currently three primary technical standards adopted by the International Telecommunication Union (ITU), namely WCDMA⁵, TD-SCDMA⁶ and CDMA2000⁷. At present, WCDMA has been implemented by all the four 3G operators in Hong Kong. For TD-SCDMA, it is a standard developed by the Mainland of China. All four 3G licensees are assigned with the spectrum that could be deployed for 3G services using TD-SCDMA standard. Consistent with the policy objectives proposed in the SPR Consultation Paper, the Government and the TA will monitor closely the market development to ensure that spectrum would be made available to the market for interested investors to launch TD-SCDMA services in Hong Kong when commercial service is launched in the Mainland of China. For CDMA2000, it is backward compatible with the IS-95 CDMA standard and is commonly adopted by a number of mobile operators in various countries, including the USA, Japan and South Korea. At present, there are over 275 million CDMA2000 subscribers in the world, including 35 million of customers in the Mainland of China.

15. Currently, visitors with CDMA handsets may enjoy automatic roaming service in Hong Kong as the CDMA2000 standard is backward compatible with the IS-95 CDMA standard. However, the discontinuation of the IS-95 CDMA service by November 2008 will imply that the existing roaming service offered to these visitors will not be available unless a replacement system is put in place in a timely manner.

⁵ WCDMA (Wideband Code Division Multiple Access), or also called UMTS (Universal Mobile Telecommunications System), is the European standard for 3G mobile services. All the four 3G licensees in Hong Kong use this standard now. For information on the technical standard, please refer to the website of the UMTS Forum at "www.umts-forum.org".

⁶ TD-SCDMA (Time Division Synchronous Code Division Multiple Access) is another technical standard for 3G mobile services developed by the China Academy of Telecommunications Technology (CATT). For information on the technical standard, please refer to the website of the TD-SCDMA Forum at "www.tdscdma-forum.org".

⁷ CDMA2000 is a technical standard developed by American standardization bodies for the provision of 3G mobile services. For information on the technical standard, please refer to the website of the CDMA Development Group at "www.cdg.org".

16. In paragraph 33 of the SPR Consultation Paper, CITB indicates that *“there may be a case for spectrum allocation and release decisions in Hong Kong to take into account the wider benefits that may be brought about through harmonisation with the Mainland’s use of spectrum for certain popular services. Such decisions may mean that, to facilitate harmonisation, we [the Government] need to ensure that spectrum which enables the use of certain technical standards for strategic reasons is made available to the market.”*

17. There are a number of strategic reasons for the Government to consider making spectrum available to enable continuity of the CDMA service. Firstly, as Asia’s World City, Hong Kong should provide visitors from all over the world with first-class mobile services. Secondly, to strengthen Hong Kong’s strategic position as the gateway between the Mainland of China and the world, roaming service in Hong Kong should continue to be made available to visitors using CDMA handsets. Thirdly, the availability of mobile platforms using all the major cellular standards of the world, including the CDMA2000 standard, will enable the industry to acquire experience in operating the services and in the development of new applications and content for all these platforms. These will reinforce Hong Kong’s position as the leading telecommunications hub in the region.

18. In order that Hong Kong may have the best telecommunications services to meet the challenges of the information age, the TA is of the view that the licensee operating the CDMA mobile service after November 2008 should be required to adopt the state-of-the-art technology capable of providing high-speed data service with data rates comparable to those using 3G technologies. The deployment of obsolescent technologies is unlikely to be acceptable.

19. As the 850 MHz band is the only readily available frequency band which enables the provision of the CDMA mobile service, the TA is of the preliminary view that sufficient spectrum in this band should be made available to the market for the provision of CDMA service. Assignment of the spectrum for services using the CDMA2000 standard will meet the need to maintain the continuity of the CDMA mobile service after 20 November 2008.

Proposal 1

The TA should make available to the market spectrum which enables the provision of a CDMA2000 mobile service after 20 November 2008.

Proposal 2

Auction should be used to determine to whom the spectrum released should be assigned.

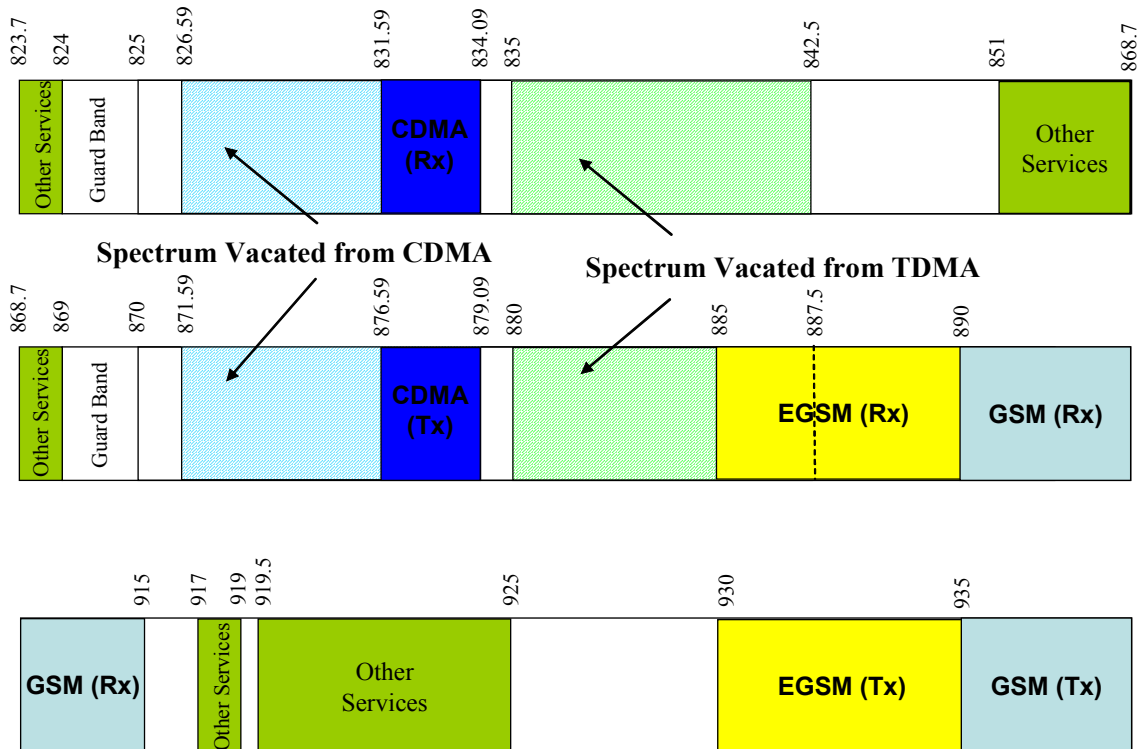
SPECTRUM PLAN IN THE 850 MHz BAND**Spectrum Availability**

20. The CDMA Licensee was assigned with the frequency band 826.59 - 834.09 MHz paired with 871.59 - 879.09 MHz. When its previous licence expired in November 2005, the CDMA Licensee has been given a migration period of 3 years with reduced frequency assignment in the range of 831.59 - 834.09 MHz paired with 876.59 - 879.09 MHz. The assigned frequencies will be vacated when the 3-year migration period expires on 20 November 2008.

21. The TDMA Licensee was assigned with the frequency band 835 - 842.5 MHz paired with 880 - 887.5 MHz. As explained in paragraph 2, this licensee had surrendered its licence and the assigned frequencies. A portion of the frequency spectrum that it had vacated (in the range of 840 - 842.5 MHz paired with 885 - 887.5 MHz) has subsequently been re-farmed for the EGSM service.

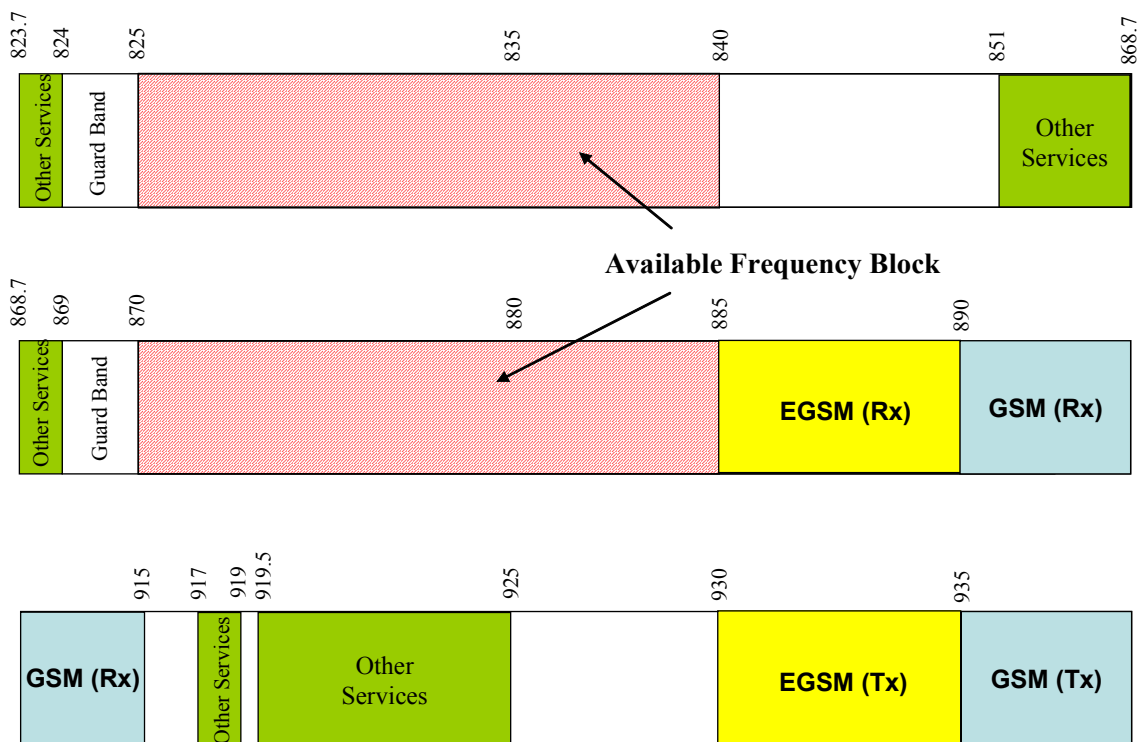
22. With the expiry of the migration period of the CDMA Licensee on 20 November 2008, a continuous block of frequency spectrum from 825 to 840 MHz paired with 870 to 885 MHz will be available for assignment. Figure 1 shows the details of the existing frequency assignment in the 850

MHz band. Figure 2 shows the available frequency blocks after 20 November 2008 when the assigned frequencies of the CDMA licensee are vacated.



* "Other Services" include Trunked Mobile Radio Systems, Mobile Data Systems, Cordless Telephones and Radio Frequency Identification (RFID) systems.

Figure 1 Existing Frequency Assignment in the 850 MHz Band During the Migration Period



* "Other Services" include Trunked Mobile Radio Systems, Mobile Data Systems, Cordless Telephones and Radio Frequency Identification (RFID) systems.

Figure 2 Available Frequency Block in 850 MHz Band at the End of the Migration Period

23. According to the latest release of the technical standard⁸ by the 3rd Generation Partnership Project 2 (3GPP2), the CDMA2000 standard adopts a carrier bandwidth of 1.25 MHz and can be deployed in the following band:-

CDMA2000 Band	Mobile Station Transmit Frequency (MHz)	Base Station Transmit Frequency (MHz)
Band Class 0	824.025 – 848.985	869.025 – 893.985

As a result, the frequency block identified in paragraph 22 can support the

⁸ The frequency bands and channel arrangement for the CDMA2000 system are specified in the specification 3GPP2 C.S0057 entitled "Band Class Specification for CDMA2000 Spread Spectrum Systems".

provision of CDMA2000 services. The paragraphs below will discuss how the frequency spectrum so vacated may be re-farmed.

Proposed Band Plan

24. To protect the continued operation of services that operate in adjacent bands, the same existing guard band as shown in Figure 1 should be maintained, i.e. the guard band at the lower end of the frequency block, 824 - 825 MHz paired with 869 - 870 MHz, should be retained.

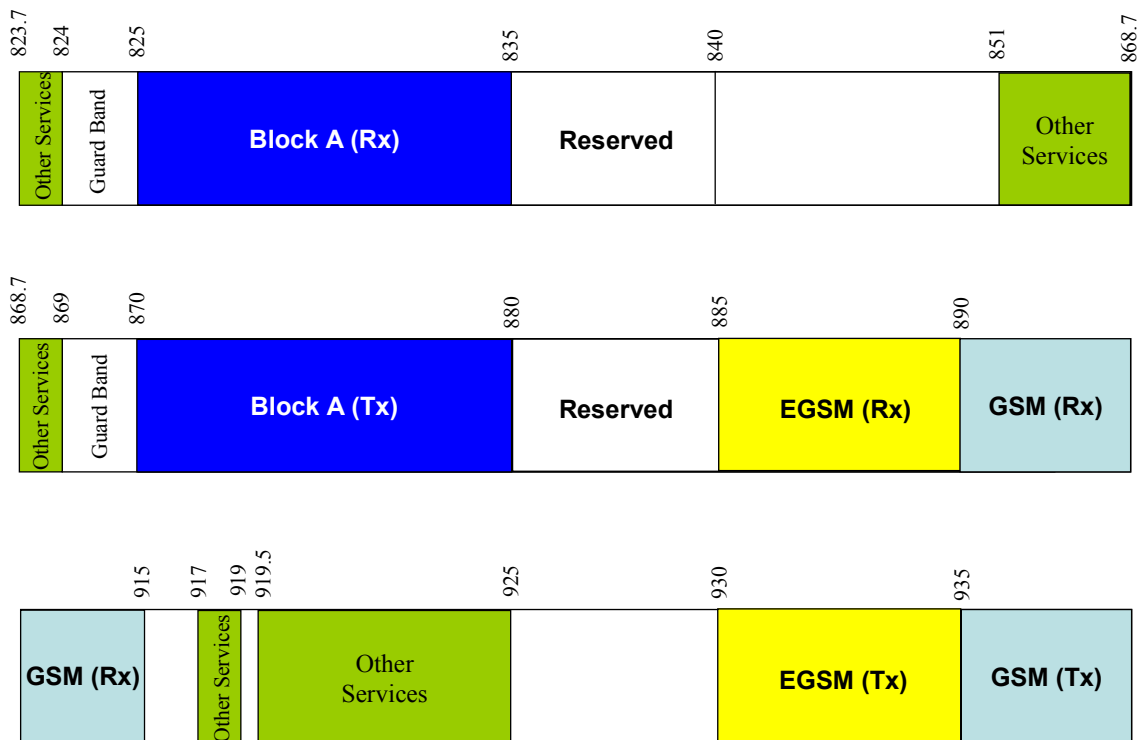
25. Similarly, a guard band of 3 MHz⁹ at the upper end of the frequency block is required to provide adequate frequency separation with the EGSM band. There are two options for the placement of this guard band. Firstly, the guard band may occupy the frequency range of 880 - 883 MHz paired with 925 - 928 MHz, thus leaving 10 MHz x 2 for the CDMA2000 service and 2 MHz x 2 for EGSM. The Radio Spectrum Advisory Committee discussed the guard band requirement between the EGSM assignments and Radio Frequency Identification (RFID) applications that operate in the frequency band of 920 – 925 MHz. A guard band of 3 MHz was considered appropriate after the conduction of compatibility tests. For this reason, the EGSM band cannot be extended further downwards beyond 928 MHz.

26. Alternatively, the guard band may occupy the frequency range of 882 - 885 MHz paired with 927 - 930 MHz. In this case, the amount of frequency spectrum that may be made available for the CDMA2000 service will be 12 MHz x 2. However, since the CDMA2000 standard adopts a carrier bandwidth of 1.25 MHz, the maximum amount of frequency spectrum that may be gainfully utilized for a CDMA2000 network is 11.25 MHz x 2. Therefore, in order that the scarce public resource of frequency spectrum may be used efficiently, the TA tends to favour the option identified in paragraph 25. This implies that a maximum amount of frequency spectrum of 10 MHz x 2, which can support 8 carriers, will be made available for the CDMA2000 licensee.

⁹ Further information regarding the guard band requirement is available in OFTA consultation paper “Licensing of Mobile Services on Expiry of Existing Licences for Second Generation Mobile Services – Analysis of Comments Received, Preliminary Conclusions and Further Consultation” dated 19 March 2004.

27. For a baseline territory-wide implementation in urban areas with voice service capability, at least three to four CDMA2000 carriers are required. Hence, the minimum required bandwidth for CDMA2000 deployment should be 5 MHz x 2. On the other hand, the TA is aware that the vast majority of the overseas regulators assign a bandwidth of 10 MHz x 2 or more to their CDMA2000 licensees.

28. Consequently, the TA is of the preliminary view that the frequencies 825 - 835 MHz paired with 870 - 880 MHz i.e. a total of 10 MHz x 2, may be made available to enable the provision of a CDMA2000 service. This amount of frequency spectrum should enable the deployment of CDMA2000 technology with coverage and capacity sufficient to cope with the customer demands at present and in the future. The proposed band plan is given in Figure 3 below. In the figure, Block A denotes the frequency block that will be available for assignment in this consultation exercise. However, since the amount of spectrum for the new licence will have a direct bearing on the Spectrum Utilization Fee that the licensee has to pay, it is not for the TA to decide what the business model should be. Parties interested in bidding for the spectrum should conduct their own market research and business studies, and their views on the optimal amount of frequency spectrum for the new licence would be welcome.



* "Other Services" include Trunked Mobile Radio Systems, Mobile Data Systems, Cordless Telephones and Radio Frequency Identification (RFID) systems.

Figure 3 The Proposed Band Plan in the 850 MHz Band

Proposal 3

The proposed band plan in the 850 MHz band as depicted in Figure 3 should be adopted. While the frequency block from 825 to 835 MHz paired with 870 to 880 MHz may be made available to enable the provision of a CDMA2000 mobile service, views on the optimal amount of frequency spectrum are welcome.

FUTURE RELEASE OF SPECTRUM FOR MOBILE SERVICES

29. To enable the provision of sufficient spectrum supply information to the industry players for making informed choice on infrastructure investments and business planning activities, one of the proposals

contained in the SPR Consultation Paper suggests that the TA should publish a Spectrum Release Plan on a three year rolling basis. The Spectrum Release Plan is expected to provide an indication for information of the industry concerning the future supply of spectrum through an open and competitive process.

30. In the foreseeable future, it is anticipated that a number of candidate frequency bands will become available and may be assigned for the deployment of mobile services. Apart from the frequency spectrum currently available in the EGSM band and the PCS band, these frequency bands include, but are not limited to, the 2.3 to 2.4 GHz band, the 2.5 to 2.69 GHz band, and the unassigned 3G TDD spectrum. The release of these bands will be subject to future consultations in due course.

31. As far as the current exercise is concerned, parties interested in bidding for the spectrum for the provision of the CDMA2000 service should be mindful of the fact that further spectrum for mobile services may be released from time to time in future. They should take this factor into account when making their business decision to bid for the spectrum in question.

PAYMENT OF SPECTRUM UTILISATION FEE (SUF)

32. Under section 32I(1) of the Telecommunications Ordinance, the TA may after consultation designate certain frequency bands to be subject to payment of Spectrum Utilisation Fee (SUF). At present, the existing 3G licensees and the 2G licensees upon the grant of the new Mobile Carrier Licences are required to pay SUF as they make use of the frequency spectrum, being a scarce public resource, for commercial purpose. It is logical that the new licensee should also be subject to the payment of SUF for the use of the spectrum assigned.

33. The 3G auction conducted in 2001 employed a royalty scheme in which the SUF was calculated by multiplying the “Royalty Percentage” to the Network Turnover¹⁰, subject to certain minimum annual fees, payable annually by the 3G licensees over the licence period of 15 years. The “Royalty Percentage”, and in turn the minimum amount of annual fees, were determined through auction. The same approach may be adopted for the 850 MHz band. However, with the passage in time, we should review whether or not the factors that the Government took into account in the decision-making process in 2001 are still valid and applicable.

34. As stated in the Legislative Council Brief issued on 13 February 2001, the main consideration for adopting the royalty payment method was to lower the financial burden of successful 3G licensees, on the assumption that the SUF payment as the result of a competitive auctioning exercise at that time would be extremely high. Furthermore, the 3G market at that time was highly uncertain, both in terms of demand from consumers and availability of services. The royalty payment method allowed 3G licensees to spread the payment of SUF over the whole licensing period and thus reduced the upfront financial burden. Furthermore, the guaranteed, minimum royalty payment requirement would minimise credit risks of the Government and reduce the costs that may be passed on to the customers. A royalty payment based on Network Turnover would also allow the Government to share the upside of the future 3G services. It was based on all these considerations and constraints that the Government decided to adopt the royalty payment method in 2001.

35. Today, many of the above considerations may no longer be valid or relevant. First, it is unlikely that prospective licensees will bid irrationally such that the SUF will be very high and the bid will subsequently become a heavy financial burden to the successful bidder. In addition, the 3G market now is much more mature than what it was five years ago. Proven network infrastructure and customer equipment are widely available from the major equipment providers in the world. Full-fledged 3G services have been launched around the globe with attractive service features at affordable prices. The industry has already accumulated a wealth of experience in the implementation and operation of 3G networks and in

¹⁰ For the purpose of SUF calculation, Network Turnover is defined as the revenue arising from or attributable to the provision of any telecommunications services over any telecommunications network using the frequency bands to which the SUF relates.

devising business strategies for marketing the services. The TA believes that the resultant SUF will be able to reflect more accurately and rationally the true commercial market value in the auction of the spectrum in the 850 MHz band and the financial burden of the prospective licensee should not be an overriding concern.

36. Furthermore, the royalty payment method is not without disadvantages. For example, both the Government and the 3G licensees have to bear high administrative costs in implementing accounting separation to ensure that all relevant revenues are included in the calculation of royalties. As a consequence, the Government finds it justified to re-visit the whole arrangement and re-evaluate various possible options, including one-off payment, for the current licensing exercise.

37. A popular and simpler alternative to the royalty payment is to use one-off SUF payment such that the bidders simply place bids through auction on the amount of one-off payment they are willing to pay for the use of spectrum. This arrangement is simple, quick and easy to administer. The amount of SUF determined by this method equally reflects the market value of the spectrum and safeguards the Government's revenue in SUF, but all the administrative hassles in determining the amount of Network Turnover can be avoided.

38. The one-off lump sum SUF payment arrangement proposed above may lead to criticisms from incumbent operators that the Government has deviated from the previous approach. The TA considers that consistency does not necessarily mean repeating past arrangements, particularly if these arrangements appear to be sub-optimal now. The reserve price and mode of payment for a particular auction should reflect the circumstances prevailing at the time of the auction and therefore need not be identical to previous ones.

39. Concerning the amount of reserve price for the one-off lump sum SUF payment, the reserve price should represent the base economic value for using the spectrum for implementing mobile services. The amount of the reserve price will be set by the Government nearer the time of the auction.

40. According to the experiences in other territories, there are a number of approaches in estimating and setting the reserve price. One approach is to make reference to the level set in the last 3G auctioning exercise held in 2001 in Hong Kong and adjustments are to be made to take into account of the change in the market and the perceived change in spectrum value after the IT bubble in 2001. Reference may also be made to the recent auctions of returned 3G licences in other countries to assess the change in the value of the spectrum. Alternatively, the base price may be based on recent international price of comparable spectrum with adjustments to take into account local factors/considerations such as the differences in population, GDP, licence period and the market situation.

Proposal 4

The use of spectrum by the licensee should be subject to the payment of one-off SUF the amount of which will be determined through open auction.

SPECTRUM AUCTION FOR AWARDING THE NEW LICENCE

41. As there is only one single block of frequencies available for licensing and it is expected that there are competing demands in the market, a simple open auction should be the best means for the award of the new licence. The TA considers that there should only be minimal pre-qualification requirements for registering of bidders' interest and for demonstration of the financial capability of the bidders. The auction process will also be made, as far as possible, streamlined and transparent. The TA is mindful of keeping the pre-qualification requirements and auction procedures simple in order to foster active participation from the industry and investors.

Pre-Qualification Requirements

42. In order to safeguard the auction result, pre-qualification of candidates for participating in the auction process is required. Similar to the 3G exercise, the pre-qualification criteria are intended to be relatively

light but should involve setting certain minimum requirements on the financial capability of the applicants. The TA preliminarily considers that the following are required for a candidate to be qualified:

- (a) 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; and
- (b) Any other relevant supporting information that the TA may deem necessary.

Auction Process

43. The TA proposes that a multiple round auction be conducted for the licensing of the relevant frequency block. In brief, bidders satisfying the pre-qualification requirements will participate in an open ascending auction and place bids on the amount of one-off lump sum payment for the spectrum assigned. The bidding will start at a pre-determined reserve price. Bidders must then place open bids in multiples of a pre-determined bid price increment. There will not be any pre-specified number of auction rounds. The auction will not stop until there are no further new bids submitted by the bidders.

44. Bidder with the highest bid will be the winner of the auction and a telecommunications licence for the provision of CDMA mobile service using the spectrum assigned will be granted to this bidder subject to its acceptance of the licence conditions. In case when the successful bidder defaults to obtain the new licence, the deposit of that bidder will be forfeited and the licence will be awarded to the bidder with the second highest bid.

45. Similar to the reserve price, the amount of the bid price increment will be determined by the Government and this will be announced nearer the time of the auction.

46. The multi-round ascending auction (MRAA) approach is recommended as it is an open, simple and transparent bidding mechanism. First, the auction rule is simple and easily comprehensible. Second, all

the bidders are kept informed of the current bid price and the identity of the current bidder submitting the highest bid. As a result, the bidders will have sufficient information for them to make informed decisions on whether to place bids or not. The auction will be more rational and realistic, thus reflecting the true market price of the right of using the spectrum assigned. Essentially, it will help the industry to discover the actual price of the use of the available spectrum. This auction method is in fact frequently practised by the regulators in advanced economies, such as the USA, the UK and Australia.

Proposal 5

It is proposed that a simple MRAA should be adopted in the licensing of the relevant frequency block. Bidders should place open bids in multiples of the bid price increment, starting from the reserve price.

Both the reserve price and the bid price increment will be announced by the Government nearer the time of the auction.

The details of the auction process will be published in due course.

Eligibility of Incumbent Carriers or their Related Companies

47. The TA is of the preliminary view that the incumbent 2G and 3G licensees or their related companies should be permitted to bid for the spectrum in the relevant frequency block provided that they meet the pre-qualification requirements. There will be more potential bidders, thus ensuring that the auction result will reflect the true market value of the available frequency block. The technical expertise of the 2G and 3G licensees will also enable faster rollout of service. To prevent spectrum hoarding by the incumbent 2G or 3G licensees, or any other parties, if any one of them successfully gets the relevant spectrum, the new licence will incorporate obligations related to network rollout and service coverage secured by the placement of a performance bond with OFTA.

48. The TA also believes that it is not necessary to impose a bidding restriction in the form of a spectrum cap, i.e. an upper limit on the total amount of spectrum that can be held by a licensee and its related companies which would disqualify the incumbent operator from bidding for the spectrum. There are currently five mobile operators in Hong Kong and the mobile service market is very competitive. It is not likely that one operator will be in an advantageous position as compared with others or competition will be significantly lessened simply because additional spectrum has been acquired in this exercise.

49. To qualify for participation in the proposed auctioning exercise, an applicant must satisfy a set of conditions governing “related parties¹¹”. The policy objective behind this is to ensure that the auction will be conducted in a competitive environment. Effectively, an individual company or group of companies may not enter more than one bid. The proposed set of conditions is detailed as follows:-

- (a) If the common ownership between two or more related applicants is at or above 50% of their shares or voting rights, they will be disqualified in the pre-qualification stage and will not be allowed to participate in the auctioning process.
- (b) If other forms of relationship (as specified in the future auction rules, e.g. common ownership in excess of 15%) exist between two or more related applicants, the parties concerned should endeavour to remove that relationship before submitting applications. If time is insufficient for that to take place prior to the pre-qualification stage, the applicants must disclose their relationship to the TA and undertake to separate in terms agreeable to the TA before the auction commences. The TA reserves the right to disqualify any application for participation in the auction, should the applicant fails to inform the TA of a relationship or fail to undertake separation.

50. Two or more existing licensees may wish to cooperate, in the form of joint venture or other types of agreements, in acquiring the licence as a

¹¹ Related parties means parties with a close relationship by means of a participation, indirect interest, or control.

single applicant. The TA proposes not to require any joint bidder to seek his consent prior to participation in the auction i.e. no *ex ante* rule applies. However, licensees are reminded that any such agreement or joint venture, as for other agreements or joint ventures, will be subject to *ex post* regulation under the Telecommunications Ordinance, including section 7K which prohibits anti-competitive conduct, and section 7P which governs any change in a carrier licence.

51. In the case where a joint bidder has won the auction and obtained the new licence, but subsequently substantial restriction or lessening of competition in a telecommunications market is established, the TA is empowered to direct the licensee in question to take actions(s) deemed necessary under sections 36B and/or 7P(1)(b) including, *inter alia*, amendment/termination of the agreement/joint venture, as the case warrants.

52. The TA is of the preliminary view that *ex post* regulation of joint bidding activities would be proportionate to the risk of any adverse effect to competition in telecommunications markets. The absence of *ex ante* approval of joint bids would also speed up the pre-qualification process.

Proposal 6

Incumbent 2G and 3G licensees should be permitted to take part in the open auction for spectrum in the relevant frequency block provided that they meet the pre-qualification requirements. In this exercise, there will not be any bidding restriction in the form of a spectrum cap i.e. an upper limit on the total amount of spectrum which will disqualify an incumbent 2G/3G licensee from bidding the spectrum.

An individual company or group of companies may not enter more than one bid.

Existing licensees may form joint venture to bid for the licence and prior consent from the TA is not required for participation in the auction.

APPLICABLE REGULATORY FRAMEWORK AND LICENCE CONDITIONS

53. The TA is currently conducting a consultation on the deregulation for fixed-mobile convergence¹². One of the proposals in the consultation is the creation of the Unified Carrier Licence (UCL). When UCL is put in place, the issue or renewal of any Fixed or Mobile Carrier Licence will be ceased. In that case, the licence to be granted for using spectrum in the relevant frequency block will be the UCL. In addition to the provisions relevant to the UCL, the new licensee will be subject to the same set of licence conditions as the incumbent 2G and 3G licensees on equity grounds as the new licensee will be capable of providing mobile services in direct competition with the incumbent licensees. If the UCL cannot be put in place in time, the existing regulatory framework applies and the new licensee using spectrum in the relevant frequency block will be granted with a Mobile Carrier Licence. When UCL phases in, the new licensee will be invited to consider migrating to the new licensing regime as and when necessary.

Interconnect Regime

54. Under the current regulatory regime, the Fixed-Mobile Interconnection Charge (FMIC) payment structure is based on a “Mobile Party’s Network Pays” (MPNP) mechanism in accordance with a regulatory guidance specified in TA Statement No.7¹³. This charge is paid by a mobile network operator to the interconnecting fixed network operator for telephony traffic both from a fixed line to a mobile phone and from a mobile phone to a fixed line. Meanwhile, as a result of commercial arrangements made between the mobile network operators, the Mobile-Mobile Interconnection Charge (MMIC) follows the “Bill and Keep” (BAK) arrangement in which no interconnection charge needs to be settled.

¹² OFTA Paper “Deregulation for Fixed-Mobile Convergence – Second Consultation Paper” dated 14 July 2006.

¹³ TA Statement, “Interconnection and Related Competition Issues Statement No. 7 (Second Revision), Carrier-to-Carrier Charging Principles”, 18 March 2002

55. The consultation conducted by the TA on the deregulation for fixed-mobile convergence as mentioned in paragraph 53 above will also examine the proposal to phase out the existing regulatory intervention related to the FMIC arrangements over an appropriate transitional period. During the transitional period, the *status quo* will continue to apply. Relevant to the present exercise, bidders are recommended to follow the progress of the said consultation and take the proposed deregulation of the FMIC arrangements into account when formulating their business plans.

Open Network Access Requirement

56. At present, the 2G and 3G licensees are required under their licences to open at least 30 % of their network capacity for access by non-affiliated Mobile Virtual Network Operators (MVNOs) or content providers. The terms and conditions for this so-called Open Network Access (ONA) should be determined by the relevant parties through commercial negotiation. The TA will only intervene in the event of a dispute over access. This requirement was first introduced in the last 3G licensing exercise in 2001 in order to meet the following Government policy objectives:-

- (a) To introduce greater competition at the content, application and service level;
- (b) To enable small and medium sized content or service providers to provide more innovative content, applications and services; and
- (c) To enable parties who do not have the resources to bid for, or who have failed to obtain, the 3G licence the opportunity to participate in the 3G market.

57. The 2G licensees are also subject to this ONA requirement upon expiry of their then existing licences and the grant of the new Mobile Carrier Licences on the ground of preserving a level playing field.

58. In regard of the present licensing exercise, the TA considers it necessary to first review the significance of the ONA requirement to the mobile industry at present, before deciding on whether the same

requirement should further be imposed on the new licensee.

59. Though the ONA requirement has been in force for nearly five years, it is noted that OFTA has not received any request for regulatory intervention concerning the ONA requirement so far. The 3G market is beginning to take off in Hong Kong and numerous non-affiliated application and content providers are now providing services to the mobile users through the 3G platforms. The situation is the same for the 2G platforms. With a high degree of competition in the mobile market in Hong Kong, market forces and economic principles prevail and will efficiently serve as the invisible hand in regulating the market.

60. The fixed carrier licensees do not have ONA obligations. The original rationale for drawing a distinction between fixed networks and mobile networks was that the latter occupy the limited public resource of spectrum. With increasing number of wireless platforms using spectrum made available to the market (including the 850 MHz band which is the subject of this consultation exercise), the rationale for using regulation to mandate ONA becomes increasingly questionable. With fixed-mobile convergence, the same set of economic principles should apply to using regulation to mandate access to networks. If justified based on economic principles of economic regulation, the Telecommunications Ordinance contains provisions that empowers the TA to mandate access to networks. The *ex ante* ONA licence obligations appear to be superfluous and out of line with current market situations.

61. Based on the above considerations, the TA is of the preliminary view that there is no need for the regulator to impose ONA obligation on the new licensee. The TA does not intend to impose the ONA requirement on the new licensee for the current licensing exercise.

62. To maintain a level playing field and taking into consideration the relevance of the ONA requirements in the current market conditions, the TA proposes that the ONA requirements as applicable to the existing 2G and 3G licensees should be withdrawn altogether. Subject to the outcome of this consultation, the TA will liaise with the existing licensees to remove the relevant licence conditions concerning the ONA requirements.

Proposal 7

The new licensee using spectrum in the relevant frequency block should not be subject to the Open Network Access requirement.

Also, the Open Network Access requirement as applicable to the existing 2G and 3G licensees should be withdrawn altogether.

Network and Service Coverage Obligation

63. In order to ensure the timely provision of CDMA inbound roaming service immediately after the expiry of migration period offered to the former licensee of CDMA service, the TA is inclined to impose a network and service coverage obligation on the new licensee. This is to ensure that the new licensee will be obliged to roll out the new network expeditiously, thus replacing the network coverage of the CDMA Licensee in the shortest possible timeframe. In this regard, inbound roamers using CDMA handsets can continue to enjoy uninterrupted service in most areas of Hong Kong.

64. The TA considers that the network and service coverage obligation for the new CDMA2000 licensee should be more stringent than that for 3G licensees. Most importantly, this is to ensure that there is prompt service deployment to avoid service disruption of the CDMA mobile service after November 2008, and to discourage any spectrum hoarding by the new licensee. The TA notes that the 3G market is much more certain and mature than that in 2001 when the 3G spectrum was auctioned. There is rich deployment experience in the world, enabling the development of a more deterministic business case. Affordable network infrastructure and consumer equipment are also widely available.

65. The TA therefore proposes that the new licensee should be obliged to provide network and service coverage no later than 1 year after the grant of the licence to the “Golden Bowl Area” plus other strategic locations like the MTR and KCR railway systems, the airport and other border control points. Details will be announced nearer the time of auction. A licence

condition will be included in the licence to address the situation that in case an incumbent operator gets the CDMA2000 licence, it cannot bypass the coverage obligation by network sharing with its existing 2G/3G network. No network sharing should be allowed within the context of coverage obligation compliance.

Performance Bond

66. As the proposed SUF payment method does not involve annual SUF payments, performance bond in the form adopted in the 3G licensing exercises is not applicable for the new licence.

67. However, the TA considers that there is still a need to impose the performance bond requirement on the new licensee to ensure its compliance with the more stringent network and service coverage obligation, thereby assuring the continuity of the CDMA mobile service in November 2008. The performance bond mechanism will protect the Government and the community against any default by the licensee. It will also act as a deterrent to spectrum hoarding by the new licensee. As a result, the new licensee will be required to lodge a performance bond with the TA to guarantee compliance with the network and service coverage obligation. The exact amount and other pertinent details of the performance bond will be announced nearer the time of auction.

Denial of Service to Suspected Stolen Handsets

68. In response to the concern of the Police on mobile phone theft, a new licence condition has been added to the Mobile Carrier Licences of the 2G licensees such that the licensees shall, where directed by the TA, refuse to provide service to any person who possesses or uses a mobile handset which is stolen or suspected stolen.

69. To combat the use of unlawful apparatus, the TA considers it necessary to extend the same requirement to the new licensee. In particular, the TA notes that the CDMA2000 standard provides adequate measures for the identification of the CDMA2000 handsets, similar to those found in the GSM standard¹⁴. A licence condition about denial of service, similar to that incorporated in the Mobile Carrier Licences of the 2G licensees, will be included so that the new licensee will be required to implement the requirement when directed by the TA. It is expected that by the time the new licence is awarded, the operational and technical details of this licensing requirement will have been specified. The TA will keep track of the progress of the implementation and will issue a direction on this matter at the time when the licence is awarded or at other more opportune time.

Domestic Roaming Requirement

70. Some jurisdictions have mandated the domestic roaming requirement, which enables new entrants to provide nation-wide coverage within a short timeframe. Under this requirement, the new entrant can make request to the incumbent operators to enable its subscribers to roam to the incumbent networks. In the last 3G licensing exercise in Hong Kong, such a requirement was also put in place, but this was not mandated as it so happened that all the successful bidders for 3G licences had affiliations with existing 2G networks.

71. At present, the use of CDMA2000 standard by the new licensee should make the domestic roaming requirement irrelevant. As there is no other incumbent mobile network operator in Hong Kong using the CDMA2000 standard, automatic roaming by the subscribers of the new entrant is not possible unless they change to GSM or WCDMA handsets or make use of dual-mode handsets supporting both CDMA2000 and GSM or WCDMA standards.

¹⁴ In the GSM standard, individual handset can be uniquely identified by using the International Mobile Equipment Identification (IMEI). Stolen or suspected stolen handsets can therefore be checked against a central IMEI database. Similarly, the CDMA2000 standard makes use of Electronic Serial Numbers (ESN) or Mobile Equipment ID (MEID) embedded in the CDMA2000 handsets for identification purpose.

72. If the new licensee finds it necessary to have domestic roaming, the new licensee may choose to become a Mobile Virtual Network Operator (MVNO) and negotiate for a commercial deal with the incumbent 2G or 3G licensees for using their network platforms.

Proposal 8

The new licensee should be subject to the following special licence conditions:-

- Network and Service Coverage Obligation
- Performance Bond
- Denial of Service to Suspected Stolen Handsets

The new licensee will **NOT** be subject to the Domestic Roaming Requirements.

TIMELINE

73. The TA would like to invite the views and opinions of the industry as well as the public on the proposals contained in this consultation paper for a period of two months. The TA targets to complete the relevant legislative work concerning the SUF proposals in six months' time.

74. The TA aims to publish the related bidding documents and applications form for information of the interested parties in August 2007. The industry will be given sufficient time to review the auction documents and to arrange for financial supports. The auction will be conducted sometime around early October 2007. The TA will strive to issue the new licence to the successful bidder by end of October 2007 so as to allow for at least one year lead time for the licensee to construct a CDMA2000 network with adequate coverage by 20 November 2008.

75. In summary, the tentative schedule is

1.	End of public consultation	Dec 2006
2.	Completion of legislative process	Jul 2007
3.	Publication of guidance notes for application and other related bidding documents	Aug 2007
4.	Conduction of auction	Early Oct 2007
5.	Issue of new licence	End Oct 2007

INVITATION OF COMMENTS

76. Views and comments on this consultation paper should reach OFTA on or before **27 December 2006**. Any person who submits views and comments should give full supporting information and detailed justifications, and 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:-

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29/F Wu Chung House
213 Queen's Road East
Wanchai
Hong Kong
Attention: TE(R21)
Fax: 2803 5112
E-mail: licensing-850@ofta.gov.hk

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

Office of the Telecommunications Authority
27 October 2006