

Licensing Framework for Deployment of Broadband Wireless Access

PCCW-HKT Telephone Limited Submission

PCCW-HKT Telephone Limited (PCCW) is pleased to provide comments on the consultation paper (Consultation Paper) issued by the Telecommunications Authority (TA) on 20 December 2004 regarding the Licensing Framework for Deployment of Broadband Wireless Access (BWA).

The Consultation Paper discusses a number of issues concerned with the possible introduction of BWA services. A large number of these are technical in nature (eg, spectrum availability and bandwidth, spectrum assignment, transmission standards, etc) while some are largely procedural (eg, methods of payment, licence period, transition to mobile usage).

However, two particular issues discussed in the Consultation Paper raise fundamental matters of principle about the appropriate regulatory approach to take when introducing BWA services in Hong Kong. The two issues are whether:

- BWA services should be licensed in Hong Kong and, if yes, the appropriate timing for inviting applications for such licences;¹ and
- BWA licences should initially be reserved for fixed carrier licensees and restricted to fixed wireless usage with “limited mobility”.²

Section A of this Submission reviews the regulatory principles which should shape the decision-making process in relation to the introduction of BWA services in Hong Kong.

It is concluded as a matter of principle that BWA services should be introduced in Hong Kong but that the approach to the licensing of these services should not be developed in isolation of the broader dynamics transforming telecommunications. For this reason, it is also concluded that BWA licences should not be issued in advance of the forthcoming reviews of fixed mobile convergence and spectrum allocation policy. As BWA embodies the concept of fixed mobile convergence, it is particularly concluded that BWA licences should not be restricted in scope to fixed usage with “limited mobility”.

Section B of this Submission responds to the details of the technical and procedural issues raised in the Consultation Paper.

¹ Consultation Paper, para 5.

² *ibid.*, paras 37-39.

A. MATTERS OF PRINCIPLE

1. Policy objective

The starting point for the BWA consultation must be the Government's policy objective for telecommunications. A statement of the policy objective informs, focuses and makes transparent the entire consultation process.³

A principal source of the Government's policy is its 1994 Position Paper on telecommunications policy which expresses three policy objectives that are particularly relevant to the consultation:

- that telecommunications services should be provided in the most economically efficient manner possible;
- that the Government wishes to see the benefits of competition reach all sections of the community as rapidly as possible; and
- that the TA will be expected to ensure that, from the consumer perspective, sensible and convenient arrangements are put in place so that consumers will be able to access freely competing services and thus exercise choice in service provision.⁴

PCCW has not been able to identify a clear statement of a policy objective in the Consultation Paper. However, consistent with the Government's broader telecommunications policy objectives, one would expect that the promotion of competition and the free availability of competing alternative services would be overriding objectives in the consultation. Indeed, these objectives can be inferred from the references in the Consultation Paper to BWA being an alternative to conventional wireline technologies.⁵

2. Competition as the preferred 'regulator'

It is clear from the above expressions of the Government policy that the promotion of competition plays an important role. However, as also recognised in the Position Paper, competition is not for competition's sake.⁶ The ultimate objective in promoting

³ Ofcom in the UK is legally required to carry out an "Impact Assessment" of regulatory decisions it makes. In producing an Impact Assessment, Ofcom lists "Defining the policy objective" as Stage 2 in the process: refer *Better Policy Making – Ofcom's approach to Impact Assessments*, Ofcom, 4 February 2005, paras 5.8-5.9.

⁴ *Position Paper: Hong Kong Telecommunications Policy*, Economic Services Branch, January 1994 (quoted in *Exchange of Traffic between Interconnected Networks - Interconnection and Related Competition Issues*, TA Statement No. 5, 20 May 1995, para 5.)

⁵ In particular, Consultation Paper, paras 8-9.

⁶ *Position Paper: Hong Kong Telecommunications Policy*, op. cit., para 6.2.

competition is to increase economic efficiency and enhance consumer welfare. In particular, competition:

- forces firms to be productively efficient (so that they provide services at the least cost) and drives prices down to the level of costs (to the direct benefit of consumer welfare).;
- brings about an efficient allocation of resources in the economy as these flow into the production of goods and services most valued by consumers; and
- encourages firms to innovate and develop new or improved products and processes, thus improving dynamic efficiency. This in turn is seen as the key to sustainable economic growth and improved living standards.

Accordingly, anything which interferes with the operation of a freely competitive market and restricts the flow of resources to their most valued use would, in principle, be at the cost of economic efficiency and consumer welfare.

Such interference includes regulatory interference. It is difficult to predict outcomes in complex and dynamic markets, particularly where there is convergence of technologies (e.g., fixed and mobile) and markets (e.g., telecommunications and broadcasting). For this reason, ‘regulation’ of the marketplace is typically left to the forces of competition unless it can be shown that there is (or will very likely be) some failure in the market which distorts the free flow of resources to their most valuable uses (with “most valuable use” being defined by consumers’ willingness-to-pay rather than by the views of particular sectoral interests).

For example, Ofcom in the UK has recently enunciated this principle in the following terms:

The principles that Ofcom will follow in analysing the costs and benefits of different options are set out below. It should be borne in mind, however, that Ofcom’s bias against intervention means that a high standard of proof must be satisfied. In other words, there must be a clear case for regulation, and the prospective benefits must exceed the costs. If a case for regulation can be made, we will choose the least intrusive means of achieving our objective.⁷

In Hong Kong, the Secretary for Commerce, Industry and Technology, Mr John Tsang, made a similar point on 27 October 2004 when commenting on the planned merger of the TA and the Broadcasting Authority (BA):

...we want a regulator that is lean and skilled. I am referring to a new regulatory philosophy as exemplified by the international paradigm shift from detailed rule-making to competition-based regulation of the communications sector. Detailed rules and guidelines could quickly become obsolete or worse still, hurdles to

⁷ *Better Policy Making – Ofcom’s approach to Impact Assessment*, op. cit., para 5.16.

innovation and investment. We suggest adopting a new regulatory philosophy that the regulator will intervene only when it is necessary to do so.

Yet, in adopting a preliminary view to have a BWA licence with “limited mobility”, OFTA appears to have gone against this principle of regulation and adopted a presumption of intervention (in the form of restricting BWA licences to “limited mobility”) without satisfying the high standard of proof required for such intervention.

3. Open licensing – technology neutrality

Accepting that the broad policy objective behind the licensing of BWA is to promote consumer welfare via increased competition and that, absent market failure, the best way to promote competition is to give market forces free play, it should be clear that an open licensing framework – in respect of both the scope of the licence and the ability to compete for it – best achieves the policy objective.

In particular, licences should not be restricted by technology or the services that such technology can provide. This matter of principle has been noted by the TA in the Consultation Paper:

Consistent with the technology neutrality principle, the Telecommunications Authority (TA) does not intend to mandate the technology to be used in the delivery of BWA services in Hong Kong.⁸

Nonetheless, having noted this principle, the OFTA then forms the preliminary view that BWA licences will only be offered as a wireless extension of the conventional fixed wireline network services with “limited mobility”.⁹ This preliminary view is justified in the Consultation Paper on the basis that:

...deployment of BWA for full mobile service at this moment in time is considered not necessary and could be reviewed later having regard to the spectrum policy review. ...fixed access is likely to be the major commercial application of BWA in the near future. The TA considers that the licensing framework for BWA as a fixed service initially may serve as a transitional arrangement in such a context, with possibility of future migration to mobile services, subject to the subsequent development of the technology, the market, and the regulatory framework.¹⁰

Certainly, not acting on BWA until spectrum issues are comprehensively addressed in the broader spectrum policy review later this year is a policy option open to the Government. However, going forward with BWA for fixed only with “limited mobility” as proposed will still utilize the selected spectrum band. This use of spectrum does not change when handsets or customer premises equipment (CPE) become fully mobile. Thus, it is not

⁸ Consultation Paper, para 32.

⁹ *ibid.*, paras 37-38.

¹⁰ *ibid.*, paras 35-36.

logical to suggest that BWA for fixed services does not impact the spectrum policy review while BWA for mobile services would.

The argument for a “limited mobility” approach was further elaborated on in the Telecommunications Perspectives column published on the OFTA web-site on 20 February 2005:

In the first few years, the BWA technology will not be able to support "full" mobility similar to 3G services. Therefore, it cannot be used inside fast-moving vehicles. This is the main reason behind OFTA's proposal that the BWA spectrum should initially be confined to "fixed" services. "Fixed" services, however, include the provision of "nomadic" services for palmtop and notebook computers, meeting market demand that is not well served at present. The timing for the technology to have the capabilities of full mobility and for the widespread availability of consumer equipment as well as the status of development of 3G services at that time cannot be accurately predicted at this point in time. If we should invite bids for the spectrum for full mobility services at this stage, there would be too many uncertainties for the bidders to make their decisions.

Mandatory "Type II Interconnection" will be withdrawn in mid-2008. Some measures are necessary to ensure that the BWA spectrum can be used for the provision of the "last mile" access rather than holding it off until the technology for full mobility services in such spectrum is mature.

However, it is not our intention that the spectrum may not be used for the provision of full mobility services throughout the entire licence period even if the technology to provide such services is mature. Upgrading to full mobility services would be possible if there are mechanisms to change the use or even the user of the spectrum assigned. Certainly this would involve the market mechanisms of spectrum trading and liberalisation, which will be the subject of a Government policy review to be initiated later this year.¹¹

It would thus appear that a large part of the justification for restricting BWA licences to fixed usage is because full mobile usage is immature and, if it was extended to mobile usage, “...there would be too many uncertainties for the bidders to make their decisions”.

The argument that full mobility is immature fails for several reasons. First, full mobile usage is not immature. It is being rolled out and used today in some markets. Among the BWA standards, the IEEE 802.16e/802.20 advocated by WiMAX Forum, 3GPP UMTS, the WiBro technology used in South Korea and other proprietary technologies such as Australia's iBurst, have mobility capability. The South Korean Ministry of Information and Communication (MIC) expects that WiBro services will be launched in 2006. It is also expected that the IEEE 802.16e standard for mobile BWA solution will be finalised in 2005.

¹¹ From “Hotspots” to “Hotzones”, OFTA, 20 February 2005.

Additionally, problems over the practical implementation of “limited mobility” have been acknowledged:

In our initial consultation document, we proposed only allowing BWA to have limited mobility... We would now need to consider whether this could actually be practically implemented. ... The delineation between nomadic service and fully mobile service is actually not clear.¹²

It is notable that the Singapore IDA proposes to auction new BWA licences without any restrictions as to whether they are fixed, nomadic or mobile.¹³ Similarly, the Wireless Broadband Access Task Force of the Federal Communications Commission (FCC) in the US has recommended the speedy deployment of BWA services in the US without restriction on usage. In particular, it recommended that the FCC:

Apply a pro-competitive, innovative national framework for wireless broadband services – one that imposes the fewest regulatory barriers at both the federal and state level – to wireless broadband services. Such an approach would enable the greatest innovations, in terms of technologies and types of services, and would maximize consumer benefits. The Task Force recommended that the Commission consider several options for achieving this goal, including classifying wireless broadband either as an “information service” or an “interstate” service, or clarifying the scope of the deregulatory principles applied to Commercial Mobile Radio Services (CMRS) – which enabled the rapid success of mobile voice and data services over the last decade.¹⁴

Second, the time line for auctions and network rollouts for BWA is mid 2006. Even if full mobility is limited in its rollout today, it certainly won't be limited a year from now. Third, a “fixed first” approach will very likely create significant policy, legal and process issues in terms of migrating and transitioning the spectrum usage to mobile. It will also no doubt delay the benefits of fully mobile applications. Finally, a single auction open to all players which allows winners bidders to employ the spectrum to meet user demands best meets the Government's overarching policy objectives, is simple and avoids predictable migration and transition issues. This approach will not be difficult for bidders (indeed it is simple for bidders). It also ensures that Hong Kong will not face any regulatory lag which would harm both the economy and users.

Limiting the use of technology does not sit well with best practice for regulatory intervention as outlined in the quotations above from Ofcom and the Secretary for Commerce, Industry and Technology. In particular, it is not the role of government to protect market players in competition from new technologies. Bidders understand well the market, the BWA technology, the 3G experience and other “uncertainties” in the

¹² *Broadband could go mobile*, South China Morning Post, 15 March 2005, p B5.

¹³ *Auction of Wireless Broadband Spectrum Rights*, Information Memorandum, IDA, 25 February 2005, p2.

¹⁴ *FCC Task Force Recommends Actions to Speed the Rollout of Wireless Broadband Services to Consumers across America*, FCC News Release, 10 February 2005.

market. It is government's role to let competitive market forces have free play, however uncertain they may be, and only intervene when those forces are not allowed free play.

The following description of the negative side of restrictive licensing in Hong Kong in 1997 is still applicable today in relation to the proposed restriction on mobile usage under BWA licences:

Entry restriction is the core of the licensing regime, and it is also the source of the regime's worst problems. Licensing confers upon the regulators significant control over market entry and market structure. By restricting entry, the government eliminates or reduces competitive market forces. The most obvious effect is to force consumers to pay higher prices. In the high-technology digital media sector, though, the inefficiencies are more subtle and pervasive than simple higher prices. The market for new services is just developing; experimentation is needed. Entry restrictions stifle the development of new services and the technological, management, and marketing skills that accompany them. Entry restrictions hamper the development of more specialized market structures and reduce Hong Kong's competitiveness in global markets.

...even if the government is entirely devoted to an economically efficient outcome, the results of a one-off licensing exercise are inherently less efficient than an open market, given rapidly changing technological and market conditions. Entry restriction forces the government to specify in its licences what kind of technology is employed and the process by which the technology is rolled out to end users. Two or three years after these commitments have been made and investments entered into, market conditions may change. Indeed, in digital media services it is virtually certain they will change. Changes will come from any number of sources. Technological developments may alter cost calculations. New sources of investment capital may arise. Or the licensee may discover that its original service bid misunderstood the nature of the market and forced the company into commitments that were unnecessary or unprofitable.

The government should make it a basic principle of telecommunications policy in Hong Kong that entry into all services will be open.¹⁵

It is in recognition of the uncertainties which are a natural part of the market that the Info-communications Development Authority (IDA) has placed this important caveat in its Information Memorandum on the proposed auction of BWA frequencies in Singapore:

This Information Memorandum is not intended to form any part of the basis of any investment decision or other evaluation of any decision to participate in the Auction and should not be considered as a recommendation by IDA or IDA's advisers to participate in the Auction. Each interested person must make its own

¹⁵ *Telecom Policy and Digital Convergence*, Milton Mueller, City University of Hong Kong Press, 1997, pp 79-80 and 130.

*independent assessment of the potential value of a WBA Spectrum Right after making such investigation as it may deem necessary.*¹⁶

5. Fixed mobile convergence reviews

There should be little doubt that fixed mobile convergence will play a significant role in shaping the future of the communications and IT industries. There should also be little doubt that regulatory action will play an important role in removing roadblocks to fixed mobile convergence.

As mobile services are increasingly used as substitutes for fixed services, it is imperative that fixed service providers be allowed to provide mobile alternatives to their customers. This necessarily means acquiring access to relevant frequency spectrum. BWA is one such frequency band in the spectrum and indeed may act as the ‘missing link’ between fixed and mobile services and may become the first technology to fully embody the concept of fixed mobile convergence. OFTA points to the implications of this in its Telecommunications Perspectives column published on its web-site on 23 January 2005:

In the future, BWA technology will be usable for both fixed and mobile services. ... In a few years’ time, BWA technology will be capable of providing full mobility services like the existing 3G services. It would then be meaningless to distinguish between fixed/mobile networks when a single access network is connected to both fixed and mobile users.

In due course, fixed and mobile services will cease to be two different types of business. Mobile services may be a substitute for fixed services for some customers, leading to a loss of fixed-line customers. Fixed network operators may also share the mobile market by the use of BWA technologies.

*Therefore, the differentiation of regulation based on fixed and mobile networks will not be sustainable sooner or later. OFTA will keep track of the development of fixed-mobile convergence and consider if it is necessary to modify the existing regulatory approach to keep abreast with industry development.*¹⁷

As previously mentioned, BWA with full mobility is in the here and now rather than being a mobile technology of the future,. Certainly it will be so in a year’s time when the BWA auctions would occur. While Hong Kong need not always be “ahead of the curve”, it certainly cannot allow itself to fall behind. A two step process would very like ensure that undesirable result.

As indicated above in the Telecommunications Perspectives column of 23 January 2005, OFTA will conduct a review on whether it is necessary to modify the fixed and mobile

¹⁶ *Auction of Wireless Broadband Spectrum Rights*, Information Memorandum, op. cit.

¹⁷ *Blurring Boundary between Fixed and Mobile Services*, OFTA, 23 January 2005.

regulatory regimes in light of fixed mobile convergence. It has also indicated that it will review fixed mobile charging arrangements in the light of fixed mobile convergence:

*The TA has received requests from mobile carriers for a more comprehensive review of charging arrangements for interconnection between the fixed and mobile carriers. With the convergence of fixed and mobile services, there are evolving and interrelated issues which will require further input from, and discussion with, the industry.*¹⁸

In PCCW's view, it would be inappropriate to make decisions on whether BWA licences should be restricted in their mobile usage in advance of these impending "fixed mobile convergence" reviews. As the TA notes in the quotation above, there are evolving and interrelated issues which require further discussion.

In response to suggestions that the BWA consultation should be deferred until the fixed mobile reviews are completed (and the spectrum policy review discussed below), OFTA has indicated that, while issues must be approached in a holistic manner, it is unrealistic to expect regulation to stop evolving.¹⁹

PCCW is not aware of any calls to stop regulation evolving, but it is aware that issues are evolving and that it would be inappropriate to make decisions in advance of a full consideration of all the issues that are relevant to that decision.

On a more practical level, there is simply not enough time to implement a fixed-only BWA licensing regime to be followed in due course by a fixed and mobile approach. Technology and market forces are too dynamic for such a gradual approach. By the time the "fixed" BWA consultation has been completed, decisions made, subsidiary legislation passed, auctions held, and fixed wireless networks rolled-out and services supplied, full mobility will be well entrenched as both a technology and a service offering in most developed markets.

Furthermore, in such a scenario of fixed-only BWA, Hong Kong would initially be adopting a restrictive licensing approach which is less open than the approaches being adopted and proposed in other countries. When a decision was ultimately made to open up the BWA licensing framework to mobile usage, the time to bridge the gap with other countries would be that much longer.

More fundamentally, a decision to adopt a BWA licensing framework involving "limited mobility" would not appear to be international best practice nor consistent with the

¹⁸ *Charges for Interconnection between Public Mobile Radiotelephone Services (PMRS), Personal Communications Services (PCS) and Value Added Services (VAS) and the Public Switched Telephone Network (PSTN) Operated by PCCW-HKT Telephone Limited*, TA Statement, 12 November 2004, para 6.

¹⁹ *Mobile operators to get a shot at broadband wireless licences*, South China Morning Post, 15 March 2005, p T2.

achievement of the Government policy objective to “...enable Hong Kong to be recognized as a world-class telecommunications centre for doing business”.²⁰

In a recent press article, OFTA recognises that regulating the supply of spectrum to protect those already in the market may not be an approach shared by regulators in liberalised markets. It is also recognised in the article that 3G operators have advantages, such as a head start, an established customer base, ubiquitous coverage and a plentiful supply of consumer terminals. Given this recognition of international best practice and the realities of the market in Hong Kong, it is therefore surprising that the position continues to be taken in the article that there will be a restriction on mobile usage (with the new option being to specify a date after which the restriction will be lifted).²¹

As OFTA notes in the article:

BWA accelerates competition between fixed and mobile operators in overlapping markets. Operators call for a level playing field in such competition. These are the very issues to be addressed in the fixed-mobile convergence review.

It is suggested that these are the very issues which should be addressed in the current BWA consultation and until they, and other related evolving issues, are addressed the outcome of this consultation could breach another regulatory principle: to fully assess the risks that an intended outcome would not be achieved.²²

In this case, the real risk is that the benefits of fixed mobile convergence may not flow as efficiently to consumers and businesses because of regulatory intervention in the market based on less than a full consideration of the issues that would happen in a fixed mobile convergence review.

5. Spectrum review

Similar considerations apply to the spectrum policy review announced by the Government on 29 November 2004. In announcing the review, the Government stated the following:

Given the rapid pace of advancement in technology development and deployment, we consider that a fundamental review of the policy for allocation and assignment of radio spectrum is warranted.

²⁰ Policy Objective booklet issued by the Information Technology and Broadcasting Bureau to accompany the Policy Address of the Chief Executive in October 2000

²¹ *Mobile operators to get a shot at broadband wireless licences*, op. cit.

²² *Better Policy Making – Ofcom’s approach to Impact Assessments*, Ofcom, 4 February 2005, para 5.20.

The objective of the review is to formulate a responsive, transparent and market-led spectrum policy to enable the community to reap the maximum benefit from the deployment of this scarce public resource as technology advances.²³

The Consultation Paper indicates that policies on the allocation and assignment of spectrum for mobile and fixed services would be included in the spectrum policy review.²⁴ In the light of this indication, PCCW considers that it would be appropriate either, as noted above, to act on the spectrum policy review issues first or to move forward with BWA without restrictions. But in no instance would it be appropriate for BWA licences with restrictions on their mobile usage in advance of the impending spectrum policy review.

As the TA notes in the quotation above, the objective of the review is to formulate a responsive, transparent and market-led spectrum policy. Achievement of this objective could clearly be undermined should decisions be made in the context of the current BWA consultation which purported to overcome market “uncertainties” by limiting BWA usage to fixed wireless for the immediate future.

6. Conclusion on matters of principle

PCCW concludes from the above principles that:

- there should be a framework for licensing BWA services;
- to put BWA licences to their most efficient and valuable use, the process for allocating those licences should be by competitive auctions;
- the licences thus issued should contain no restrictions on the use to which the frequencies allocated under each licence are put – whether fixed, nomad or mobile usage;
- any proposal to artificially restrict the scope of BWA licences should clearly:
 - identify and, where possible, estimate the costs and benefits of that proposal against the policy objective behind the proposal;
 - assess the risks that the intended objective will not be achieved; and
 - identify and assess the impact of each option on particular groups of stakeholders, including consumers.

²³ *New Licences for Existing 2G Mobile Services to be Granted*, Commerce, Industry and Technology Bureau (CITB), Press Release, 29 November 2004.

²⁴ Consultation Paper, para 35.

Adopting best practice on regulatory intervention, a heavy burden of proof is placed on the regulator to overturn what should be a presumption of non-intervention in competitive markets where such intervention of its nature will limit the ability of market participants to compete openly.

As communications in Hong Kong is clearly competitive in all its dimensions, one would expect a detailed regulatory impact statement along the lines required of Ofcom in the UK to justify why intervention is required.²⁵ Being broadly-based consultations which will take into account the views of a large range of interests and stakeholders over a wide range of issues, the forthcoming fixed mobile convergence and spectrum policy reviews should be ideal opportunities to develop such a regulatory impact statement.

The Consultation Paper does not, in PCCW's view, put forward a case for justifying intervention to restrict the scope of proposed BWA licences to fixed-use with only "limited mobility". As a matter of principle, PCCW therefore does not agree with the preliminary view to restrict the scope of BWA licences. It is PCCW's conclusion that new BWA licences should not be issued until the costs and benefits of such a restriction are fully assessed and weighed (preferably in the fixed mobile convergence and spectrum policy reviews).

Having dealt with the matters of principle, the following Section of this Submission now deals with the each of the particular issues raised in the body of the Consultation Paper.

²⁵*Better Policy Making – Ofcom's approach to Impact Assessments*, Ofcom, 4 February 2005

B. RESPONSES TO EACH ISSUE

1. Licensing of BWA services and timing

Issue 1: The TA invites views on whether BWA should be licensed in Hong Kong and if yes, the appropriate timing for inviting applications for such licences. (para 5)

PCCW considers that, as a matter of principle, there should be a fully open licensing scheme in Hong Kong for BWA services. However, PCCW notes that the TA's preliminary view on Issue 7 below is to initially restrict BWA licences to fixed usage with only "limited mobility". In such circumstances, PCCW suggests that new BWA licences should not be issued until the costs and benefits of such a restriction are fully assessed and weighed in line with regulatory best practice. Preferably, such an assessment should occur in the context of the impending spectrum policy review.

The reasons for PCCW's views on this issue have been discussed in Section A as matters of principle and regulatory best practice.

2. Appropriateness of 3.5 GHz band

Issue 2: Having regard to the gradual withdrawal of mandatory Type II interconnection by 2008, the considerations above and the unavailability of spectrum in other candidate frequency bands for BWA, the TA is of the preliminary view that the 3.5 GHz band is a possible and could be the most appropriate licensed band for BWA deployment in Hong Kong. (para 15)

PCCW acknowledges that all the frequency bands in which BWA may operate are already allocated for other services or may have problems of co-ordination. However, on the basis of the technology neutral principle discussed in Section A, and also by the TA in relation to Issue 6 below, PCCW considers that the spectrum bands for BWA usage should not be artificially limited.

Accordingly, while it supports the use of the 3.4-3.6 GHz band in line with international practice, bands such as the licence-exempt 2.3 GHz band should not be debarred from BWA usage because of any problems about coordination. As discussed, the market should ultimately decide these issues in the absence of any demonstrated market failures. ETSI HiperMAN, WiMAX and 3GPP UMTS are technologies that can operate in the 3.4-3.6 GHz band, but equally other technologies such as WiBro operate in the 2.3 GHz band. Clearly, this option would be denied to potential investors and operators if OFTA limits BWA usage to the 3.4 - 3.6 GHz band. It should be noted that Singapore is allowing BWA deployment in the 2.3 and 2.5 GHz bands.

In view of the fact that a large part of the 2.3 GHz band in Hong Kong is vacant and that other countries such as South Korea, Singapore and the US have decided to open this band for mobile BWA, it is considered that the TA should allow BWA operators to have more flexibility in adopting the technology of their choice by offering the 2.3 GHz band as well as the 3.4-3.6 GHz band for auction.

Furthermore, the proposal for only “limited mobility” with BWA would exclude 3GPP UMTS. If only “limited mobility” is allowed, PCCW understands that the only standard under the WiMAX forum that can satisfy these stringent requirements would be IEEE 802.16-2004, which revises and replaces IEEE 802.16, 802.16a, 802.16c and 802.16REVd.

Although the 802.16e standard will be backwards compatible with 802.16-2004, its 'walk-about' mobility makes it likely to fall outside of the consultation proposal. The 802.20 standard will provide more powerful mobile communications in fast moving vehicles and hence would also be likely to be excluded due to its fast mobility and handoff capability.

3. Spectrum sharing between FSS and BWA services

Issue 3: Having considered the international deployment of spectrum for BWA, the possible benefit that BWA may bring into Hong Kong, the gradual withdrawal of mandatory Type II interconnection in the run up to 2008, the equipment availability, the co-existence between BWA and FSS, the TA is of the preliminary view that the 3.4 - 3.6 GHz band may, depending on the actual requirement of BWA, gradually be allocated to BWA on a primary basis. FSS may still be used in this band on a secondary basis, or in a 600 MHz band outside the 3.4 – 3.6 GHz band on a primary basis. The TA invites views from the industry on this spectrum management issue. (para 19)

As OFTA notes, the 3.4-4.2 GHz band is currently allocated to fixed satellite services (FSS) on a primary basis. With the proposed introduction of BWA into this band, it is clearly important that any wireless transmissions in the band be free from interference. Interference, no matter whether it is committed maliciously or inadvertently by third parties, is not tolerated in telecommunications, particularly for commercial purposes. For this reason, use of spectrum frequencies is typically allocated on an exclusive basis.

The importance of non-interference is recognised as a matter of government policy and reflected in licences and the law: licensees are not allowed to use an apparatus that causes direct or indirect harmful interference with any telecommunications service lawfully carried on in Hong Kong under GC 3 of the Fixed Carrier (FC) Licences, GC 8 of the Fixed Telecommunications Network Services (FTNS) licences and section 32J of the Telecommunications Ordinance.

PCCW acknowledges that there is the risk of interference between FSS and BWA in the 3.4-3.6 GHz band, particularly because of the high sensitivity of satellite downlinks. For this reason, the proposal to gradually allocate the 3.4-3.6 GHz band to BWA on a primary basis, with FSS still being used in this band on a secondary basis, is problematical. It is considered that the options of using bands outside the 3.4-3.6 GHz band and, perhaps, use within the band on a co-ordinated co-primary basis should be more fully explored.

Of course, these options lend themselves well to further study within the broader spectrum policy review scheduled for later this year. In such a forum, the benefits and costs of adopting any BWA options would take into account the broader spectrum policy issues. Furthermore, any decisions made now in relation to BWA spectrum usage could pre-empt decisions in the spectrum review, with potentially adverse consequences for the over-riding objectives of economic efficiency and consume welfare.

As to BWA and the 2008 phase out of compulsory unbundling, PCCW does not see a direct or strong link. Other services will be introduced, 3G will mature and network build-outs will occur before 2008. Commercial arrangements will also be struck.

4. Spectrum sharing between TDD and FDD and bandwidth requirements

Issue 4: For coexistence of TDD and FDD services within the 3.4 – 3.6 GHz band, proper band plan will be devised to address the interference issues. Proper geographical separation of TDD and FDD systems will also be arranged where possible. The TA invites views from the industry on any other measures that will help tackling the interference issue. The TA would also like to receive input from interested parties on their expected bandwidth requirement and modes of operation (TDD or FDD) for BWA. (para 22)

As to views on tackling the interference issue, one should not be too arbitrary and inflexible in dealing with this matter. Flexibility in the spectrum allocation arrangement is the key to attracting more investors to bid for the BWA spectrum, to allocate scarce resources efficiently and to maximize the value of the spectrum.

It should be noted that the supply of frequency blocks may not effectively match the actual demand by investors. In maximizing the utility and economic value of 3.4-3.6 GHz band, or other available bands, the frequency blocks and their number should as much as possible take into account the BWA technologies to be adopted by investors. Additionally, the TA should allow room in the blocks for licensees to change technology or usage (eg, full mobility).

One option may be to auction the relevant frequency blocks in sequence based on information about the preferences of the majority of eligible operators. This information could then be used to assist in the design of the frequency blocks, ascertain the optimum number of BWA licences that can or should be issued, and calculate the guard band to

avoid interference between the adjacent blocks of frequency division duplexing (FDD) and time division duplexing (TDD). Flexibility should be maintained to ensure that the allocated spectrum and the guard bands are large enough for investors to change or upgrade the use of their spectrum to other standards.

Turning to expected bandwidth requirements, PCCW notes that in Korea each operator has been assigned around 30 MHz of spectrum for WiBro. In the UK, PCCW has acquired 2 x 20 MHz frequency blocks for its BWA services. The experience with “fixed” BWA in Mainland China as discussed in the Annex is that the allocation of limited bandwidth (2 x 10.5 MHz frequency blocks per operator) may have created problems for the licensees. In PCCW’s view, it is desirable that at least 40 MHz of spectrum should be allocated to each operator.

5. Allocation of frequency blocks

Issue 5: The TA is of the preliminary view that a paired band of 14 MHz x 2 for each block for IEEE 802.16 or ETSI HiperMAN service provision and an unpaired band of 20 MHz for each block for UMTS TDD service provision may serve the need of BWA in the 3.5 GHz band. The TA invites views from the industry on the proposed channel bandwidth and bandwidth for each block.

Subject to the industry demand, the TA may ultimately allocate roughly three 14 MHz x 2 paired frequency blocks and four 20 MHz unpaired frequency blocks. The frequency spectrum allocated for BWA in the initial phase may however be limited, and the TA will decide the spectrum pool to be offered based on the industry’s immediate need. The TA invites views from the industry on the total bandwidth allocated for BWA in the initial phase. (paras 24-25)

Technological neutrality would dictate that BWA transmission standards should not be confined to the IEEE 802.16-2004, ETSI HiperMAN and UMTS TDD in designing the frequency blocks. Some investors may only have plans to deploy mobile BWA in Hong Kong and the paired frequency blocks for FDD services based on IEEE 802.16-2004 may not be the desired technology for these investors due to lack of mobility. Accordingly, it is suggested that potential BWA operators be invited to provide information on their preferred technology and the bandwidth required for that technology.

Of course, some BWA technologies are in the developmental stage and BWA standards may be subject to revision. Indeed, the proposed auction is likely to be 12 months away and technology (and standards) are still evolving. The following table provides a list of BWA standards which may be adopted by operators for the provision of BWA services. ETSI HiperMAN, IEEE802.16e and IEEE802.16-2004 are interoperable but others are not at the present time.

BWA Standards	Operates in	Technology supports mobility and handoff	Compliance with TA's proposal, ie operate in 3.4 -3.6 GHz band with "limited mobility"
ETSI HiperMAN*	2 - 11 GHz	No	✓
IEEE802.16-2004*	2 - 11 GHz	No	✓
IEEE802.16e*	2 - 6 GHz	Yes	✗
IEEE802.20	Below 3.5 GHz	Yes	✗
WiBro	2.3 GHz	Yes	✗
3GPP UTMS	1.9 GHz, 2.0 GHz, 2.5 GHz and 3.4 -3.6 GHz	Yes	✗

* Interoperability guaranteed

6. Standards and technology neutrality; dominance in equipment market

Issue 6: Consistent with the technology neutrality principle, the TA does not intend to mandate which technology or technologies should be used in the delivery of BWA services in Hong Kong. The TA invites views from the industry on this proposal. In addition, he would like to invite views as to whether the concerned equipment market being dominated by one or just a handful of manufacturers should be a valid regulatory concern from a competition perspective. (para 32)

The issue of technology neutrality is dealt with in Section A of this Submission. PCCW fully supports the intention of the TA not to mandate the technology to be used in the delivery of BWA services in Hong Kong.

In relation to the issue of whether there should be a competition concern about the relevant equipment market being 'dominated' by one or a handful of manufacturers, it is suggested that it would be inappropriate for OFTA to take a position on this issue in advance of observing how the market develops in relation to BWA services. As BWA has not yet been introduced in Hong Kong, to adopt such concerns would be akin to adopting a presumption of dominance without any market in which such services are provided (let alone any empirical evidence from that market).

Notwithstanding this matter of principle, the Consultation Paper notes that there are a number of competing BWA equipment vendors²⁶ and standards.²⁷ The Paper also notes there are a number of competing local access and mobile technologies.²⁸ PCCW

²⁶ Consultation Paper, para 14.

²⁷ *ibid.*, paras 26-31.

²⁸ *ibid.*, paras 3-4.

considers that it would indeed be presumptuous to form a presumption of dominance given this competitive mix of services, standards and equipment vendors.

Even in the unlikely event of a ‘tipping effect’ occurring and one or a handful of equipment manufacturers dominating, it is not the role of a regulator to predict the ‘winner’. As OFTA has recently noted in the press:

As the regulator, the Office of the Telecommunications Authority has no basis to pick and choose the winning technologies. To restrict or delay BWA’s entry in order to protect 3G would imply that the regulator had decided 3G was a better wireless technology.²⁹

7. Mobility restriction in BWA licences

Issue 7: The TA is of the preliminary view that BWA in Hong Kong may initially be offered as a wireless extension of the conventional wireline based fixed network service. Under this proposal, BWA spectrum should be reserved for carriers with an intention to establish fixed networks in Hong Kong. Interested parties who are not already fixed carrier licensees should apply for a fixed carrier licence before they are eligible to bid for the BWA spectrum.

To differentiate BWA services from a full mobile service, the TA proposes that the service offered by a fixed carrier licence through BWA would only be allowed to have ‘limited mobility’. ‘Limited mobility’ here shall be interpreted as no cell handoff capability allowed.

The TA would like to invite views from the industry on this proposed licensing arrangement for BWA in Hong Kong as given in paragraphs 37 and 38. (paras 37-39)

As discussed in Section A of this Submission, PCCW understands that full BWA mobile technology is in the here and now. If not now, it certainly will be so in a year’s time when the “fixed” BWA consultation has been completed, decisions made, subsidiary legislation passed, auctions held, and fixed wireless networks rolled-out and services supplied.

By that time, full BWA mobility will be entrenched as both a technology and a service offering in most developed markets. In such a scenario, should Hong Kong initially adopt a restrictive licensing approach which is less open than the approaches being adopted and proposed in other developed markets, then when a decision was ultimately made to open up the BWA licensing framework to mobile usage, the bridging of the gap with other countries would be that much longer and difficult.

²⁹ *Mobile operators to get a shot at broadband wireless licences, op. cit.*

It is notable that the Singapore IDA proposes to auction new BWA licences without any restrictions as to whether they are fixed, nomadic or mobile³⁰ and that the Wireless Broadband Access Task Force of the Federal Communications Commission (FCC) in the US has recommended the speedy deployment of BWA services in the US without restriction on usage.

Among the BWA standards, the IEEE 802.16e/802.20 advocated by WiMAX Forum, 3GPP UMTS, the WiBro technology used in South Korea and other proprietary technologies such as Australia's iBurst, have mobility capability. The South Korean Ministry of Information and Communication (MIC) expects that WiBro services will be launched in 2006. It is also expected that the IEEE 802.16e standard for mobile BWA solution will be finalised in 2005.

In 2004, the FCC in the US and the Norwegian Post and Telecommunications Authority of Norway respectively assigned 3.6-3.7 GHz and 3.5 bands GHz respectively for BWA usage, including mobile. Recently, the MIC and the Singapore IDA announced the assignment of the 2.3 GHz and the 2.5 GHz bands respectively for BWA usage including mobile. At the Annex to this Submission one may find an overview of mobile BWA licences in other countries.

PCCW notes that OFTA has recently floated a new option of specifying a date after which the mobility restriction will be lifted.³¹ However, this option presupposes that there will still be a restriction on mobility and is not considered to go far enough. Lacking any indication to the contrary, it also presupposes that mobile and other non-carrier or fixed licence holders (such as PNETS licensees) will have to apply for fixed carrier licence before they can bid for BWA licences.

The holding of FTNS or FC licences as a prerequisite for the application of another licence is not on its face logical. Such an arrangement was not found in the relation to the licensing of mobile carriers in 2001 even though 3G was said at the time to be natural technological extension of the conventional 2G mobile services. If OFTA is minded to restrict mobile usage, then logically it should restrict that usage and not impose burdensome requirements to be a carrier licensee – it simply does not achieve the objective.

More fundamentally, acceptance of the principle of technological neutrality (as done in relation to Issue 6) would dictate that there be no restrictions on mobility in BWA licences. PCCW fully supports technological neutrality and, accordingly, considers that the TA should not mandate “limited mobility” in BWA licences.

Equally important, as mobile services are increasingly used as substitutes for fixed services, it is imperative that fixed service providers be allowed to provide mobile alternatives to their customers. This necessarily means acquiring access to relevant frequency spectrum. BWA is one such frequency band in the spectrum and indeed may

³⁰ *Auction of Wireless Broadband Spectrum Rights*, Information Memorandum, op. cit., p 2.

³¹ *Mobile operators to get a shot at broadband wireless licences*, op. cit.

act as the ‘missing link’ between fixed and mobile services and may become the first technology to fully embody the concept of fixed mobile convergence.

As observed in Section A of this submission, regulatory best practice would dictate that there should be no restrictions on mobile usage in BWA licences and, if there are, a heavy burden of proof is required to establish the case. Again, the impending spectrum policy review scheduled for later this year would appear to be the ideal forum for attempting to establish the case for over-riding the principal of technological neutrality.

8. Spectrum assignment method

Issue 8: Taking into accounts the pros and cons as set out above, the TA is of the preliminary view that the BWA spectrum may be assigned by auction. (para 43)

PCCW agrees that the assignment of BWA spectrum should be done via auction to ensure transparency and equity.

9. Spectrum usage fees (SUF) - payment methods

Issue 9: Based on the consideration above, the TA is of the preliminary view that SUF for BWA spectrum may be charged annually on a per MHz basis. (para 49)

A fundamental principle is that charges and fees should be set by market forces. This is acknowledged in the Consultation Paper.³² Market forces determined the 3G fees:

A fair operating environment does not mean imposing on BWA operators the same spectrum utilisation fee as with 3G. That fee was determined by the market at the time of the 3G spectrum auction.³³

PCCW considers that similar principles should apply in relation to the proposed auction of BWA spectrum.

10. Licence period

Issue 10: The TA is of the preliminary view that a usage period of ten years may be sufficient for successful bidders of BWA spectrum. The actual spectrum usage period will however be subject to the licence validity period as mentioned above. (para 52)

³² Consultation Paper, para 44.

³³ *Mobile operators to get a shot at broadband wireless licences*, South China Morning Post, 15 March 2005, p T2.

PCCW considers that the term of BWA licences should be for 15 years to provide a solid timeframe within which important network investment decisions can be made.

Of course, there are matters of detail which need considering. Again, PCCW suggests it would be most appropriate to consider these in the broader context of the spectrum policy review but issues to be considered would include:

- would the incumbent BWA licensees have the first right of refusal and that right be granted subject to utilization of assigned spectrum based on number of subscribers?
- would the BWA licence period be extended for another 15-year period?

11. Surrendering unused spectrum

Issue 11: The TA is of the preliminary view that successful bidders of BWA spectrum may be given the option to return any unused BWA spectrum to the Government, thereby reducing the level of SUF payment, over the spectrum usage period except for the initial 5 years. (para 54)

This is an issue that should be considered in the broader context of the spectrum policy review so as to give air to other options adopted in other jurisdictions such as spectrum trading. The advantages of spectrum trading is scarce spectrum resources are freely traded and efficiently reallocated through the market mechanism. The transacted price can truly reflect the demand and supply of spectrum in the market. Licensees can also use spectrum trading as an exit strategy. Further, any time lags between the surrender of licences and their re-auctioning by the Government can be avoided.

12. Changes in SUF with changes in modes of usage (eg, mobility)

Issue 12: The TA would like to invite comments from the industry on his preliminary views concerning the various issues on SUF for BWA as given in paragraphs 43, 49, 52 and 54. (para 56)

As a matter of principle, PCCW does not agree that BWA licences should have restrictions on mobility as noted above in relation to Issue 7. Accordingly, it does not comment on this issue.

PCCW-HKT Telephone Limited

16 March 2005

Overseas trends in mobile BWA licences

The following notes on the recent development of mobile BWA in the developed countries indicate that the regulators of these countries tend to favor mobile BWA or let the operators decide the mode of operations themselves. If the purpose of the introduction of BWA is to maintain the competitiveness of Hong Kong in telecommunications in Asia (and the world), the TA should issue mobile BWA instead of artificially barring mobility and handoff.

In addition, most of these countries have designated 2.3 GHz or other frequency bands for mobile BWA services. Therefore, the TA should seriously consider allocating the 2.3 GHz frequency band for mobile BWA so that operators have more flexibility in selecting the technology for the BWA services.

1. Australia

iBurst broadband wireless service was launched in March 2004. iBurst which operates in 1.79 GHz, 1.9 GHz and 2.3 GHz supports roaming within its network's coverage areas. Handoffs between base stations are automatic and completely transparent to the users.

2. South Korea

In January 2005, the MIC announced that it would issue licences to three telecommunications firms to provide new wireless Internet services based on WiBro in the 2.3 GHz band in the following month. Commercial launch of WiBro services with mobility and handoff is expected in the mid 2006.

3. Singapore

On 28 July 2004, the IDA issued an explanatory memorandum to invite companies to apply for the Market Trial Licence to conduct trials on BWA. The 2.3 GHz and 2.5 GHz spectrum frequency bands will be assigned to applicant companies on a first-come-first-served basis. The Market Trial Licence contains no mobility and handoff restriction clauses.

On 23 February 2005, IDA announced its intention to assign the 2.3 GHz and 2.5 GHz spectrum frequency bands for BWA. According to IDA the aim of allocating spectrum for BWA is to facilitate the deployment of the innovative broadband technologies and to offer consumers a wider variety of broadband options. The licensees will be allowed to provide any type of fixed or mobile BWA services, subject to licensing requirements, after 31 December 2005.

4. Norway

In November 2004 the Norwegian Post and Telecommunications Authority assigned licenses in the 3.5 GHz band which were designed to be as technology neutral as possible and to give licensees the greatest possible freedom to implement their technology of choice. The licenses have no explicit power limitations and permit fixed, nomadic and / or mobile services.

5. The US

On 15 April 2004, the FCC issued a Notice of Proposed Rulemaking governing wireless broadband operations in the 3,650 - 3,700 MHz band, which can be used for both fixed and mobile commercial wireless services. The FCC wants to allow unlicensed devices that operate within the band in order to bring broadband access to more Americans, particularly those living in rural areas.

6. Malaysia

Malaysia has comparatively low broadband penetration rate. According to the statistics of the Malaysian Communications and Multimedia Commission ("MCMC"), Malaysia had low broadband penetration rate at the end of December 2004, i.e. 252,501 connections out of a 25.5 million population. It is also the reason why the Malaysia government issued fixed BWA licences to accelerate the broadband network coverage to both the urban and rural areas in the country in previous years.

In 2003 MCMC awarded three blocks each (out of the 23 blocks) of multimedia multipoint distribution service (MMDS) spectrum in 2.504 - 2.688 GHz band to AtlasONE and TT Dotcom Sdn Bhd, a unit of Time dotCom Bhd. The spectrum had been re-designated from broadcasting to provision of wireless broadband services. AtlasONE's 2.5 GHz broadband service will complement the 3.5 GHz fixed wireless broadband service it currently has for its corporate customers.

TT Dotcom Sdn Bhd uses 2.6 GHz spectrum to provide fixed wireless broadband service with speed ranging from 384Kbps to 512Kbps.

In mid 2004 MCMC awarded blocks of MMDS spectrum in 2.504 - 2.688 GHz band to Jaring. In December 2004 Jaring launched its fixed wireless broadband and voice-over-Internet Protocol services for customers in Kuala Lumpur and the surrounding Klang Valley area. Jaring's broadband network was supplied and installed by Soma Network Inc. The wireless technology is proprietary.

NasionCom Holdings Bhd is a licensed Network Facility Service Provider. It delivers its broadband technology to its customers via Radio Frequency wireless technology. Its broadband speed can scale up to 30 Mbps because of its private owned spectrum bands of 3.5 GHz, 10 GHz, 26 GHz and 28 GHz.

Had HKSAR required fixed BWA network to extend its broadband coverage, the TA should have granted the fixed BWA licence several years ago. Compared with Malaysia, HKSAR has higher broadband penetration rate and better fixed broadband network coverage, it is puzzled why the TA is unwilling to take a forward looking view to issuing the needed mobile BWA licence for the benefits of broadband users.

7. Mainland China

Since 2001 the Ministry of the Information Industry of Mainland China has issued licences of 2 x 31.5 MHz frequency blocks in 3.5 GHz spectrum band (shared by 3 operators in each city) through tender for the provision of fixed BWA in major cities in Mainland China.

The fixed BWA services initially acted as a supplement to the fixed broadband network. Later the services have developed and directly competed with the fixed broadband services such as ADSL. The evidence indicates that it is not commercially viable for licensees to provide the fixed BWA services alone due to fierce competition in the broadband market in Mainland China. The licensees have to bundle the fixed BWA with other services to survive.

The experience of deploying fixed BWA in Mainland China cities may give the hindsight to the TA and investors that the benefits of establishing a wireless network bring no competitive advantages to the fixed BWA licensees in Hong Kong, because almost all business entities and households are ready to receive broadband services through facilities-based services there. It is doubtful whether the very competitive Hong Kong broadband market can accommodate 7 more fixed BWA services providers as proposed by the TA, which provide services very similar to fixed network broadband services and nomadic BWA services currently provided by fixed carriers and PNETS licensees through WiFi.