

REACH LTD.

**COMMENTS ON THE TELECOMMUNICATIONS AUTHORITY'S
SECOND CONSULTATION PAPER CONCERNING
LICENSING FRAMEWORK FOR
DEPLOYMENT OF BROADBAND WIRELESS ACCESS
ANALYSIS OF COMMENTS RECEIVED,
PRELIMINARY CONCLUSIONS AND FURTHER CONSULTATION
OF 31 AUGUST 2005**

21 NOVEMBER 2005

Reach Ltd.

Comments on the Telecommunications Authority's

Second Consultation Paper Concerning

Licensing Framework for

Deployment of Broadband Wireless Access

Analysis of Comments Received,

Preliminary Conclusions and Further Consultation

of 31 August 2005

21 November 2005

INTRODUCTION

- 1.1 Reach Ltd (“**REACH**”) provides this submission in response to the Telecommunications Authority’s (“**TA**”) second Consultation Paper “*Licensing Framework for Deployment of Broadband Wireless Access, Analysis of Comments Received, Preliminary Conclusions and Further Consultation*”, dated 31 August 2005 (“**Second BWA Consultation**”).
- 1.2 We appreciate the TA’s action in advising the industry of his preliminary views and putting his proposals for a broadband wireless access (“**BWA**”) licensing framework to further public consultation. REACH also welcomes the opportunity to again comment on this matter, which is of considerable interest and concern to fixed satellite service (“**FSS**”) operators.
- 1.3 REACH’s comments are made on behalf of its subsidiary, Reach Networks Hong Kong Limited (“**Reach Networks**”). Reach Networks holds, jointly and severally with Reach Cable Networks Limited (“**RCNL**”) and Reach Global Services Limited (“**RGSL**”)¹, a Fixed

¹ Reach Networks, RCNL, and RGSL are 100% owned by REACH.

Carrier (“FC”) Licence in Hong Kong under which it supplies a broad range of telecommunications products and services to other operators.

- 1.4 Aside from an overarching interest in the further development of regulation within Hong Kong’s telecommunications market, REACH has a particular interest in the Second BWA Consultation as a provider of wholesale international satellite capacity. REACH’s interest in the Second BWA Consultation flows from REACH’s position as having established Asia’s largest commercial teleports, with more than 20 operating antennas at its teleport sites in Hong Kong and a further 15 antennas at its teleport sites in Perth and Sydney, Australia. REACH’s teleport facilities are strategically positioned at REACH’s major Asia-Pacific network nodes to leverage REACH’s extensive investment in cable capacity around the globe, and provide a full range of teleport services in the Asia-Pacific Region.

2 COMMENTS

General

- 2.1 REACH’s principal activity in Hong Kong is that of an international carrier providing global connectivity services to other carriers and service providers. Therefore, REACH provides its comments herein largely from the perspective of a provider of wholesale satellite capacity and services. As such, and as not all the preliminary conclusions reached by the TA in the Second BWA Consultation are pertinent to the provision of wholesale satellite capacity and services, REACH has addressed only those issues relevant to such wholesale operators.
- 2.2 Accordingly, REACH comments herein on only spectrum for BWA in Hong Kong matters in the Second BWA Consultation.

Spectrum for BWA in Hong Kong

- 2.3 REACH would first state that it does not seek to hinder or oppose the development of BWA. However, any regulatory decisions aimed at the promotion of a specific technology like BWA need to be considered in an overall context which ensures that vital and valuable existing services supporting widely recognised and important business and consumer needs and demands are not dismissed or undermined, and that the providers of these existing services are not rendered impotent in their ability to either provide these services or to seek recourse when their operations are disrupted by the deployment of new technologies such as BWA by others.
- 2.4 Moving to specifics, the TA has reached a preliminary conclusion that he “*considers it reasonable and proportionate to allocate 3.4 – 3.6 GHz band to be used for BWA services on a primary basis while allowing the frequencies to be used for FSS on a secondary basis*”².
- 2.5 As commented by REACH in its reply submission (“**REACH Comments**”)³ to the TA’s initial BWA consultation (“**Initial BWA Consultation**”)⁴, REACH believes that the allocation of the 3.5 GHz band to BWA on a primary basis would not only have serious interference implications for current satellite downlink operations, but may also have negative implications for satellite related investment decisions that (absent any previous indications otherwise) have been made upon a reasonable assumption that any frequency allocations by the TA would align with International Telecommunications Union (“**ITU**”) regulations⁵ – and that ITU designated satellite downlink frequencies would be available for satellite operations in Hong Kong. Such assumptions will have been reinforced by the fact that, to date, the 3.4 GHz – 3.7 GHz band in Hong Kong has been allocated to FSS as the extended C-band – and that a number of satellites that currently cover Hong Kong already have extended C-band transponders, for example, APT, Thaicom, and Palapa. REACH does

² See paragraph 22 of the Second BWA Consultation.

³ See paragraph 2.3 of “*Comments on the Telecommunications Authority’s Consultation Paper Concerning Licensing Framework for Deployment of Broadband Wireless Access of 20 December 2004*”, REACH, dated 14 March 2005.

⁴ See the TA’s Consultation Paper, “*Licensing Framework for Deployment of Broadband Wireless Access*”, dated 20 December 2004.

⁵ ITU - Radio Regulations, Article 8 – Frequency Allocations (“**RR8**”), 1990.

not consider that the interference and other issues raised in the REACH Comments have been adequately addressed in the Second BWA Consultation.

- 2.6 REACH also notes that the TA considers that “*due to the potentially massive deployment of BWA stations in the territory, co-primary terminus allocation for both FSS and BWA is not feasible in a small and densely populated place like Hong Kong*”⁶. While the TA has expressed concern for the *potentially* massive deployment of BWA stations, REACH is concerned about the consequences for the *actual* and *demonstrable* existing large-scale deployment of FSS and the actual and foreseeable negative implications that making primary allocation of the 3.5 GHz band to BWA has for FSS. Furthermore, relegating FSS to a secondary allocation status means that FSS operators will not have the right to object to, nor have access to an effective mediation avenue concerning, interference from operators who have been given the primary frequency allocation.
- 2.7 In paragraph 19 of the Second BWA Consultation, the TA comments that “[t]o avoid potential interference from BWA stations, the two external fixed carriers may choose to change the operating frequencies to some other frequencies in 3.6 – 4.2 GHz which will remain to be allocated to FSS on a primary basis. There should be little technical constraint on the changeover. The impact of the re-classification of the frequency allocation to FSS in the 3.4 – 3.6 GHz from “primary” to “secondary” for the earth station is therefore considered relatively small”. While it may indeed be technically feasible for FSS operators to move to the 3.6 – 4.2 GHz band, REACH does not believe the TA has considered that this band on a satellite may already be used or congested, nor assessed the cost involved in reconfiguring a satellite transponder to transmit at a different frequency. Further, the TA does not appear to have taken into account certain commercial implications of the proposal that FSS should change bands.
- 2.8 For example, in the REACH Comments, we made the point that the ITU has issued Radio Regulations which allocate the frequency band 3.4 GHz - 4.2 GHz to satellite downlink services, and that both FSS and satellite operators would be justified in assuming that the TA

⁶ See paragraph 15 of the Second BWA Consultation.

would allocate frequencies as recommended by the ITU. Both FSS and satellite systems and operations, and associated investment decisions, will have been premised on this. If the TA should now allocate the 3.5 GHz band to BWA, and as customers for satellite services would be reluctant to have to rely on a “secondary” allocation because of potential interference, Hong Kong based satellite operators may find demand for the 3.4 – 3.6 GHz band transponders on their satellites virtually non-existent. This may leave these satellite operators with stranded investment in these transponders – the cost of which these operators will have to recover through charges for the use of other transponders, increasing the price of those services to their existing customers and, in turn, to the end customer. This may have a significant impact on the cost of existing satellite-based services – affecting the large numbers of *actual* customers for, and end users of, these services in order to accommodate *potential* BWA users.

- 2.9 The TA seems to recognise that there are issues with the allocation of the primary 3.5 GHz band to BWA when he comments “[w]ith the above re-arrangement of the 3.4 – 3.6 GHz band allocation, some end users currently subscribing to FSS operating in this band may possibly be affected to a certain extent after the deployment of BWA systems”⁷, yet the Second BWA Consultation does not provide details of the analysis undertaken by the TA to determine the manner and extent to which these FSS services and end users will be affected.
- 2.10 For instance, REACH understands that due to the nature of BWA transmissions in the 3.5 GHz extended C-band, these transmissions will in fact encroach upon the entire C-band – because of overloading of the earth station Low-Noise Amplifiers by BWA operations. Given the relative high power of terrestrial BWA base station and receiver emissions compared to the very low power of satellite signals received by the antenna at the earth stations, it is highly probable that (in addition to the extended C-band) the standard C-band satellite signals will also be smothered by BWA emissions – interfering with, among others, overseas TV receive signals. This has been the experience in Sydney⁸.

⁷ See paragraph 23 of the Second BWA Consultation.

⁸ See “Death by Overload”, Parts 1 and 2 in the February and March 2005 edition of Silicon Chip magazine.

- 2.11 Even if REACH were to operate in just the standard C-band, BWA transmissions at 3.5 GHz cannot be filtered because there is no step-function filter available commercially; and REACH could not protect any C-band services by filtering because BWA transmissions would create in-band interference.
- 2.12 REACH notes that in the Second BWA Consultation the TA minimises any concerns regarding the impact of the proposal to allocate the 3.5 GHz band to BWA on TV programming with by saying that very few TV receive systems would be affected, and that the TV programmes received are foreign programmes from overseas generally not targeting Hong Kong or the local majority. The TA goes on, in relation to these TV programmes, to say that “[t]hey are broadcast from satellites not registered in Hong Kong and are not Hong Kong licensed programmes”⁹. REACH does not believe that this view fully represents the implications of the TA’s BWA proposals for Hong Kong’s satellite broadcasters.
- 2.13 One factor that may not have received adequate consideration is that receiving and re-transmitting satellite TV programming is an essential feature of the satellite broadcasting industry, and a very important source of revenue for these operators. Therefore, while some programming may not be targeted specifically at Hong Kong, it may be passed from one satellite to another via earth stations located in Hong Kong, with the signal being amplified in the process. The revenues generated from such re-transmission services will have been material considerations in an operator’s decision to locate in Hong Kong, and they will also represent material contributions to the operator’s ongoing business. As REACH has already commented, use of the 3.5 GHz band for BWA is likely to interfere with not just the extended C-band, but also the standard C-band – both key frequencies for satellite TV transmissions in Asia. Any negative consequences of this allocation on re-transmission service revenues will not be limited to just these services – a requirement to recover costs through other service revenues will arise as these costs will no longer be shared with these re-transmission revenues, and customers for these other services will suffer as a consequence. As a number of satellite broadcasting operators are customers of REACH, we also would not be immune to developments that limit the viability of re-transmission operations.

- 2.14 A less obvious implication of interference with satellite receive signals is that the satellite programming above is largely common throughout Asia – and includes some international news services. As a result of interference, business and other influential visitors to Hong Kong may no longer be able to receive these programmes in their hotel rooms. While this may not seem particularly concerning, Hong Kong’s lack in this area may not leave an impression conducive to promoting Hong Kong’s image as “Asia’s world city”. REACH also understands that interference associated with BWA operations in the 3.4 – 3.6 GHz band may also impact signals received by global data centres operating in Hong Kong.
- 2.15 Further, REACH does not find the TA’s undertaking that he “*would ensure that the concerned licensees (including those of SMATV systems and external fixed carriers with earth stations possibly affected) are kept informed on this issue so that these licensees may prepare in advance and communicate with their own clients accordingly*”¹⁰ very reassuring. We are uncertain that the TA will be in a position to foresee all future developments and issues and, even where the TA is able to provide advance notice, that licensees will be able to do much to mitigate interference and other service issues for their customers once the decision to allocate the 3.5 GHz band to BWA has been made, given effect, and associated BWA equipment has been installed.
- 2.16 In this context, we note that while the TA has offered some degree of protection to the telemetry, tracking, command and monitoring earth stations in the Tai Po area (although there are industry reservations about the effectiveness of this protection), the TA has not offered any protection (or even seemed to recognise that there could be an interference issue) for the REACH teleport at Stanley (which is the largest such commercial facility in Asia) and Cape D’Aguilar earth station. Further, as the TA anticipates that BWA technology will also be deployed for mobile services in the future, it is difficult to see how any protection zones or buffers can be effectively enforced once there is widespread use of mobile BWA receive equipment. The extent of the TA’s advice has been that REACH can change operations to the 3.6 – 4.2 GHz frequency range – upon which REACH has commented on above.

⁹ See paragraph 21 of the Second BWA Consultation.
¹⁰ See paragraph 23 of the Second BWA Consultation.

2.17 We also observed in the REACH Comments that while one of the TA’s justifications for recommending that the 3.5 GHz band be allocated to BWA was because equipment operating in this band is already available on the market, there is equally commercially available equipment working in other bands – and already being used in other jurisdictions. REACH would, as well, suggest that the 3.4 – 3.6 GHz may not be the most appropriate band to employ for BWA from a technical mobility perspective. Earlier this year, *Wireless Asia*¹¹ in an article on deployment of BWA in Hong Kong reported that:

“[b]ut while BWA mobility offers the biggest potential, it also seems the most doubtful performer. In particular, mobile WiMAX in the 3.5-GHz band is pretty much a non-starter. W-CDMA licensees struggling for ubiquity in the 1900- to 2100- MHz range know a little about the difficulties of deploying mobile in a higher band.

Research firm Maravedis observes WiMAX needs lower bands to “economically deploy networks for full mobility.” Bands above 3 GHz “are not suitable for mobile networks” because of the sheer number of base stations required. The WiMAX Forum is even trying to persuade regulators to surrender frequencies in the 400- to 700- MHz range.”

2.18 Similar views that WiMAX for mobile applications will be delayed for at least another two years were expressed by Mr. Ferrie Hu, Asia Pacific Director of WiMax Forum, in a recent FMC Forum in Hong Kong.

2.19 Such industry observations cast doubt on the appropriateness of the 3.5 GHz band for BWA – if BWA is intended to have reasonable mobile capability in the future. Recent BWA trial test reports posted on the Office of the Telecommunications Authority’s website tend to reflect these doubts about BWA mobility using the 3.5 GHz band – expressing reservations or inconclusive results in respect of BWA under non line of sight conditions (which will be essential for credible mobile services).

¹¹ “HK’s wireless tangle”, *Wireless Asia*, April 2005.

- 2.20 We also noted in the REACH Comments that the TA appeared, in the Initial BWA Consultation, to rely on precedent in places like the United Kingdom, Australia, and Mainland China as justification for allocating the 3.5 GHz band to BWA in Hong Kong. REACH, in its comments, observed that these jurisdictions were not necessarily appropriate as precedents for Hong Kong related decisions because of the significant geographic size differences between them and Hong Kong. In particular, that these jurisdictions are able to impose proximity restrictions preventing the location of BWA stations close to earth stations, thereby drastically reducing any potential interference issues at what are already relatively remote earth station locations. Hong Kong does not have the same luxury of space that these places do.
- 2.21 REACH would also make the point that the C-band is not widely deployed in Europe for FSS – the Ku band being the preferred choice there. However, because of the regular periods of heavy rainfall in Asia, C-band is used because it is more resilient to rain fade – and therefore is widely deployed for FSS operations and associated VSAT, internet provision, point-to-multipoint, and TV and data broadcasting services. Consequently, making a comparison to Europe as a justification for allocation of the 3.5 GHz band to BWA in Hong Kong is not a valid comparison. As to the Australian 3.5 GHz band BWA experience, REACH has already referenced “Death by Overload” above – with some 100,000 satellite TV customers being severely affected by the commencement of BWA operations using this band.
- 2.22 In terms of more appropriate jurisdictions to serve as references for BWA deployment and bandwidth allocation in Hong Kong, Singapore is obviously the prime candidate. In this context, REACH is aware that the Singapore Government is offering attractive tax incentives for satellite service providers to establish their operations in Singapore. With such incentives, plus the absence of BWA activities in the 3.4 GHz - 4.2 GHz band, the TA could well expect to see a migration of satellite service provider operations from Hong Kong to Singapore, along with businesses and employment associated with and reliant upon satellite communications.

3 CONCLUSION

3.1 As concluded in the REACH Comments, REACH recognises that business and consumer benefits may arise from BWA as technology develops, and supports a measured and balanced regulatory framework under which any such potential benefits of BWA have the opportunity to be realised. However, it is not appropriate that BWA be allocated frequencies that have previously been set aside for FSS – with the setting aside of these frequencies for satellite being fundamental elements of satellite related investment decisions. REACH believes that the allocation of the 3.5 GHz band to BWA will have considerable negative consequences for satellite operators and service providers, particularly when competing with others in the Asia Pacific region for new business opportunities using the extended C-band. Accordingly, REACH considers that the TA should look for an alternative to the 3.4 – 3.6 GHz band for BWA, rather than stripping this band from the providers of satellite-based services.