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QUALCOMM Incorporated would like to thank the Hong Kong Office of the Telecommunications Authority (TA) for the opportunity to comment on its consultation paper entitled *Licensing of Mobile Services on Expiry of Existing Licenses for Second Generation Mobile Services – Analysis of Comments Received, Preliminary Conclusions and Further Consultation* dated 19 March, 2004.

QUALCOMM is the primary developer of Code Division Multiple Access (CDMA), the world's fastest growing wireless communications technology, which is used by more than 202 million subscribers worldwide. CDMA solutions are available for a number of communications applications, including mobile cellular, fixed wireless and satellite communications. QUALCOMM supports both major IMT-2000 standards, CDMA Multi-Carrier (CDMA2000) and CDMA Direct Spread (WCDMA), which share a common underlying CDMA technology base.

In its response, while addressing some of the specific points the TA raises in its paper, QUALCOMM will focus on the opportunity for either new or existing operators to provide CDMA2000 services in the 800 MHz frequency in Hong Kong, including the provision of roaming and the development of a wireless data market.

Licensing Arrangements for the Existing CDMA and TDMA licenses – P. 9-11

QUALCOMM notes the TA's proposal not to offer the existing CDMA and TDMA licensees the right of first refusal upon expiry of their licenses. QUALCOMM believes the critical issue is that the spectrum of these licensees be used efficiently. If the existing operators agree to promote efficient utilization of the spectrum and improve user service, then QUALCOMM would support the TA granting existing operators the right of first refusal.

QUALCOMM urges the TA to consider the global experience of licensing 3G (WCDMA), particularly as many analysts and industry officials believe that these licenses were overpriced and hindered network roll-outs.¹ Should the TA find it necessary to price the 800

¹Telcos Confirm 3G Auctions Were a Big Mistake, Mobile CommerceNet, May 22, 2003.

MHz spectrum, QUALCOMM would recommend that the TA consider a different fee structure in order to reflect the real market value of the license.

Licensing Conditions Applicable to New License Only - P. 35-36

In order to facilitate voice and data roaming as well as further spur the development of an advanced mobile data market in Hong Kong, QUALCOMM supports the TA's proposal that suitable targets be specified for the 800 MHz spectrum to correspond to an active level of mobile data services and usage.

In addition, QUALCOMM supports the TA's intent to require the licensee to provide its network and services to cover at least 50% of the population with a peak data rate per radio carrier of at least 2 Mbps in 3 years time from the grant of the license. CDMA technology can easily address these requirements. CDMA2000 1xEV-DO is commercially available and currently offers peak data rates of 2.4 Mbps in a dedicated 1.25 MHz channel.

Although QUALCOMM adheres to the TA's principle of technology neutrality, QUALCOMM supports the TA's view there is an opportunity for the introduction of advanced and innovative mobile data services supported by the CDMA2000 standard. QUALCOMM also agrees with the TA that there exist economies of scale of certain technologies in certain bands, such as CDMA technology in the 800 MHz band, which predispose a carrier to use that bandwidth for a specific technology.

Roaming and Data Services

Hong Kong is a major international hub – for tourism, business travel and commerce – by land, air and sea. CDMA voice and data roaming is important for Hong Kong's strategic location both with the mainland and in the greater Asia region. China's recent policy decision to increase cross-border traffic between the mainland and Hong Kong means more and more wireless users will expect to have automatic roaming. China Unicom's CDMA2000 1x system was launched in 2002 and today has over 24 million subscribers. This number is expected to increase to approximately 35 million by the end of 2004. China Unicom is currently expanding its nationwide CDMA 2000 1x system coverage and is increasing its CDMA 2000 1x network capacity to 70 million subscribers by the end of June, 2004. China Unicom is also conducting commercial trials in multi-cities of CDMA2000 1x EV-DO and is expected to upgrade its nationwide CDMA2000 1x network to 1x EV-DO in the near future.

A robust CDMA2000 network would also address the necessity for voice and data roaming services for those who live outside of China and Hong Kong's borders, but travel through Hong Kong frequently. There are currently 77 CDMA2000 1x and 9 1x EV-DO commercial networks across Asia, the Americas and Europe. An additional 16 1x and 6 EV-DO networks are scheduled to be deployed in 2004. In Hong Kong's neighboring Southeast Asian countries, networks using CDMA2000 1x in the 800 MHz band have been deployed in Vietnam, Thailand and Indonesia within the last 16 months. Of the 202 million CDMA subscribers, the Asia Pacific region accounts for over 84 million.² QUALCOMM expects CDMA networks worldwide to continue to grow substantially in the coming years.

CDMA2000 offers Hong Kong an additional means of providing high speed data services to the business and residential community. CDMA2000 1x EV-DO currently provides operators and consumers with peak data rates of up to 2.457 Mbps on the forward link and 153.6 Kbps on

² <http://www.cdg.org/worldwide/index.asp>

the reverse link in a 1.25 MHz environment. QUALCOMM continues to work on enhancements of CDMA2000 and WCDMA. For example, QUALCOMM recently announced and demonstrated Release A of CDMA2000 1xEV-DO that offers faster forward- and reverse-link speeds with peak data rates of 3.1 Mbps on the forward link and 1.8 Mbps on the reverse link with latency in the 30 mSec range, which vastly improves the performance of low-latency applications such as video telephony, voice over Internet protocol (VoIP) and multiplayer games.

An operator that deploys CDMA2000 and high speed data services can potentially achieve higher average revenues per user (ARPU), consumers can enjoy innovative applications and Hong Kong can further enhance its application developer community. Today there are thousands of application developers that are creating the content that will drive data services. In addition to much talked about applications such as gaming, pictures, email, information and position location services, QUALCOMM's BREW³ technology is spurring the development of applications that are also helping educators and health officials better serve society. One example of such an application is CardioNet Cardio Monitoring which provides 24 hour mobile cardiac telemetry service using a wireless ECG device. Since its inception, over 1,000 devices have been deployed to help patients.

In Korea, KT Freetel's wireless Internet revenue increased 505% from the introduction of CDMA2000 1x in 2001 until the end of 2003, while SMS revenue has remained flat.⁴ Since the launch of 1x data services in Korea there has also been substantial growth in the amount of local content providers. Currently, Korea has over 1000 content providers, each with 10-300 employees. Another estimated 500 small to medium sized IT companies are providing various wireless Internet related solutions and equipment to operators.

Conclusion

QUALCOMM would again like to thank the TA for the opportunity to comment in the TA's consultation regarding the expiry of its second generation licenses. QUALCOMM believes the TA and Hong Kong have an opportunity to spur the development of an innovative wireless data market and facilitate roaming through the introduction of an active CDMA2000 wireless network. Please contact me at scovell@qualcomm.com or at 852-2537-1622 if QUALCOMM can be of further assistance.

Regards,



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cc: Ming Li, President, QUALCOMM Hong Kong and Taiwan

³ QUALCOMM's Binary Runtime Environment for Wireless (BREW) is an open, standard and extendable applications platform that resides on the wireless device and is complimentary to other applications platforms such as Java.

⁴ KT Freetel's Monthly Fact Sheet (April 2004).