QMAX COMMUNICATIONS PTE. LTD.

RESPONSE TO IDA'S CONSULTATION PAPER ON THE SPECTRUM FRAMEWORK FOR FOURTH GENERATION (4G) MOBILE COMMUNICATION SYSTEMS IN SINGAPORE

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Background

QMax Communications Pte. Ltd. ("QMC") has been providing Fixed and Mobile WiMAX services to the Singapore market since the allocation of the WBA Spectrum in 2005.

QMC was selected to deploy and operate the Wireless Broadband Access for Seaport (WISEPORT) infrastructure by MPA and IDA under the Infocomm@SeaPort Programme in March 2008. As part of this roll-out, QMC has set-up wireless access infrastructure along the southern coast and islands in Singapore to provide wireless broadband access to ships and harbour craft that are within the Singapore port waters.

QMC currently owns 50 MHz of spectrum in the 2.3 GHz band. This is after acquiring an additional 20 MHz of spectrum from DoCoMo InterTouch in 2009 with the view of possible network expansion.

Response to Questions

Question 1
IDA invites views and comments on the projected spectrum requirements to meet end users' demand for mobile broadband beyond 2015. To what extent can the existing wireless and mobile networks support the anticipated increase in mobile traffic?

IDA also invites views and comments on the likely technologies for the deployment of 4G mobile communication system that will meet end users' mobile communication needs beyond 2015.

With the higher adoption of mobile devices which have greater data consumption capabilities, QMC anticipates that there will be a huge increase in demand for affordable mobile broadband. QMC's opinion is that TDD technology such as WiMAX or TD-LTE are currently the most efficient for mobile broadband because of their asymmetric nature. Besides QMC's WiMAX network, there are currently no known commercial mobile networks in Singapore making use of TDD technology.

Question 2
IDA invites views and comments on the possible radio-frequency spectrum bands, besides the 700/800 MHz, 2.3 GHz and 2.5 GHz bands, that would be suitable for 4G mobile communication systems and the likely timeframe for deployment. To what extent are the 900 MHz, 1800 MHz and 2.1 GHz alternative bands for 4G deployment? Are there other frequency bands that are currently not allocated but could be potential candidates for 4G system deployment?

QMC's opinion is that the 700/800 MHz, 2.3 GHz and 2.5 GHz bands are currently the most suitable for 4G mobile communication systems. In some countries, the 3.5 GHz bands are also being used for WiMAX deployments.

Question 3
IDA invites views and comments on the demand for the 2.5 GHz band after 2015 in Singapore, and the technologies that are currently being developed for use in the 2.5 GHz band. Are these likely to complement or substitute existing networks? Please also comment on the availability of the network equipment.

No comments.

Question 4
IDA invites views and comments on the paired and unpaired spectrum arrangements in the 2.5 GHz band after 2015.

No comments.

Question 5
IDA invites views and comments on whether the size of 5 MHz guard block at the frequency boundaries between paired and unpaired spectrum is sufficient to safeguard the adjacent band. IDA also invites views on our proposal not to specify guard block requirement between licensees using the TDD or FDD band.

Guard block at the frequency boundaries between paired and unpaired spectrum is definitely required. However, having a mandated size for the guard block of 5 MHz may not be the most efficient method as technology improvements may reduce the size of the guard block needed.

With regards to unpaired spectrum, QMC's opinion is that it would be helpful if IDA can help coordinate between operators on a fixed uplink / downlink symbol ratio to minimize interference between operators. This is to remove the need for any guard bands between the operators of unpaired spectrum and to prevent operators of trial networks from interfering with commercially operating networks. This fixed uplink / downlink symbol ratio must be based on usage patterns of mobile broadband in Singapore so that the spectrum is most efficiently used.

Question 6
IDA invites views and comments on whether allocating 5 MHz spectrum lot size is appropriate for the current technologies in the 2.5 GHz band. IDA also invites views on our proposal to allocate spectrum in individual blocks of 5 MHz and let operators who need a larger carrier size to combine multiple blocks together. Alternatively, should IDA allocate in larger blocks based on multiples of 5 MHz?

No comments.

Question 7
IDA invites views and comments on our proposal for an interleaved band plan with combinations of 15 MHz and 20 MHz paired spectrum blocks as well as 25 MHz of unpaired spectrum blocks available for assignment in contiguous block of 15 MHz, 20 MHz and 25 MHz respectively by IDA and whether this would be appropriate.

IDA also invites views and comments on the practical measures that operators would implement to allow coexistence of BSS and mobile services in the same band in the border areas so that more spectrum blocks can be made available.

25 MHz of spectrum for unpaired spectrum would allow for 5 channels of 5 MHz carriers or 2 channels of 10 MHz carriers. QMC's opinion is that for a dense urban landscape like Singapore, a minimum of 3 channels of 10 MHz is required for efficient network deployment.

Question 8
IDA invites views and comments on the likely technologies for the 2.3 GHz band and the availability of network equipments for use in the band. IDA also invites views on our proposal to retain the existing channeling plan for the 2.3 GHz band and to allocate the spectrum in blocks of 5 MHz when the band is re-allocated after 2015. Please also comment on whether the current amount of 50 MHz spectrum available in the 2.3 GHz band is sufficient to meet industry demands after 2015.

As compared to 2005 when the 2.3 GHz spectrum was auctioned, network equipment using 2.3 GHz band is now widely available. QMC's opinion is that for a dense urban landscape like Singapore, a minimum of 3 channels of 10 MHz is required for efficient network deployment. QMC would like to suggest that IDA increases the block size to 20 MHz and make available at least 4 blocks in order to allow operators the option of deploying a network based on a carrier size of 20 MHz, and providing wireless broadband access speeds in excess of 100 Mbps. For frequencies where interference is likely, IDA may wish to restrict the said frequencies to indoor use.

Question 9
IDA invites views and comments on what is an appropriate timeframe for IDA to allocate the 2.3 GHz and 2.5 GHz bands. Should the allocation of the 2.3 GHz band proceed separately from that of the 2.5 GHz band, given the greater uncertainty over the timeframe in which the 2.5 GHz band would be available? If so, when would be an appropriate timeframe for IDA to allocate the 2.3 GHz band?

QMC would like IDA to provide an option for existing rights holders to extend their spectrum rights expiring on 30 June 2015 and to help make available additional spectrum in the 2.3 GHz band. Allocation of 2.3 GHz band should take place within 3 years of spectrum rights expiring, and should proceed separately from the 2.5 GHz band given the greater uncertainty over the timeframe in which the 2.5 GHz band would be available.

QMC notes IDA's concern about exposure of operators to greater risk due to 3 years advance planning. However, QMC is of the view that early allocation would also allow existing operators to have certainty of planning for any new network deployment, or upgrades of currently deployed networks. For new operators, early allocation would also allow them to plan ahead and reduce their risk of not meeting any service provisioning obligations that IDA may impose.

Question 10
IDA invites views and comments on what would be a fair and efficient allocation mechanism for the 2.5 GHz band. In the case where there are existing deployments in the band, should IDA grant first rights of refusal for the current right-holders?

In the case where there are existing deployments in the band used to provide Wireless Broadband Access with reasonable commercial success, first rights of refusal should be granted to the current right-holders in order to prevent service disruption due to spectrum churning.

Question 11
IDA invites views and comments on the proposal to impose both service provisioning and coverage obligations on the operators awarded the 2.3 GHz and 2.5 GHz spectrum after 2015. In particular, what would be an appropriate service provisioning obligation and the timeframe for deployment bearing in mind that the spectrum assignment is likely to take effect only from 1 July 2015? Similarly, what would be an appropriate measure for service coverage obligation and the timeframe for deployment?

Service provisioning and coverage obligations should be imposed on operators awarded the 2.3 GHz and 2.5 GHz spectrum so as to prevent spectrum hoarding. The measurement criteria for service coverage can be based on RSSI of greater or equal to -100 dBm with 90% outdoor area coverage probability.

Timeframe for start of deployment is recommended to be based on 12 months from award of spectrum.