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Qualcomm Incorporated would like to thank the Commerce and Economic Development Bureau (CEDB) and the Office of the Telecommunications Authority (OFTA) for the opportunity to provide comments on their *Second Consultation on Development of Mobile Television Services*. As the CEDB and OFTA may already be aware, Qualcomm is a leader and innovator in the development of digital wireless technologies including those based on Code Division Multiple Access (CDMA) and Orthogonal Frequency Division Multiple Access (OFDMA). These solutions are available today for a number of communications applications, including mobile cellular, fixed wireless access, broadband wireless access, trunking and satellite services. Qualcomm broadly licenses its technologies to more than 150 device, infrastructure, application-specific integrated circuit (ASIC) and test equipment vendors around the world and is interested in the success of all the air interfaces that use CDMA and OFDMA technologies, including CDMA Multi-Carrier (CDMA2000), CDMA Direct Spread (WCDMA/HSPA), CDMA Time Division Duplex (UTRA TDD & TD-SCDMA), Ultra Mobile Broadband (UMB), and Long Term Evolution (LTE).

Qualcomm is at the forefront of mobile multimedia broadcast technology development and has been instrumental in the development of MediaFLO™, a mobile broadcast platform for the delivery of high-quality entertainment and information, including streaming video and audio, Clipcasting™ media, IP datacasting and interactive services.<sup>1</sup> FLO™ (Forward Link Only) is an open, globally-recognized air interface standard based on coded OFDM modulation. Invented for mobility, MediaFLO is designed to increase capacity and coverage, as well as reduce costs for multimedia content delivery to mobile devices.

MediaFLO is based on open and global standards with seven published Telecommunications Industry Association (TIA) specifications.<sup>2</sup> MediaFLO is included as Multimedia System M in ITU-R Recommendation BT.1833 for mobile broadcasting, approved by the International

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<sup>1</sup> [www.mediaflo.com](http://www.mediaflo.com)

<sup>2</sup> TIA-1009 (Radio interface), TIA-1102 (Receiver minimum performance specification), TIA-1103 (transmitter minimum performance specification), TIA-1104 (Test application protocol) and TIA-1120 (transport specification), TIA-1132 (Repeater minimum performance specification), and TIA-1130 (Media Adaptation Layer specification); See <https://www.tiaonline.org/standards/technology/tm3/>.

Telecommunication Union Radiocommunication Sector,<sup>3</sup> and is in the approval process at the European Telecommunications Standards Institute (ETSI).<sup>4</sup>

MediaFLO technical specifications are driven and supported by the FLO Forum ([www.floforum.org](http://www.floforum.org)), an international organization with over 99 leading wireless and broadcast industry companies from all regions of the world. The FLO Forum objective is to enable an open and wide ecosystem to meet the varied requirements of a growing standards based, multi-vendor environment. FLO Forum initiatives include the definition of necessary interface standards that will significantly lower the barriers to entry for alternative suppliers to offer compatible solutions in a modular fashion. The FLO Forum works collaboratively and on a consensus, contribution-driven basis to generate technical specifications for submission to global standards and regulatory bodies.

It is recognized that operators may opt to deploy other mobile broadcast technologies and that, in today's global marketplace, operators wish to take advantage, to the greatest extent possible, of economies of scale and leverage support for multiple standards. In recognition of this trend, Qualcomm has developed a single integrated chip for mobile phones that supports multiple mobile TV standards in addition to FLO. Qualcomm announced the 2007 commercial availability of a mobile broadcast modem currently supporting the FLO, DVB-H, and ISDB-T standards on a single chip in the UHF band.<sup>5</sup> Other suppliers of semiconductor solutions for mobile digital TV, including include Newport Media, Siano Mobile Silicon and Telechips Inc., have also announced plans to design, manufacture and sell certain semiconductor chip products that implement FLO technology and to develop multi-standard chips supporting FLO and other standards.<sup>6</sup>

Mobile TV is a fast evolving market of potentially great value. The service can deliver a wide range of multimedia entertainment, news, and other beneficial content to people on the move, assistance in emergencies, educational programs, and more. Qualcomm believes there is significant interest in mobile broadcast multimedia services in Hong Kong and other countries around the world and designed the MediaFLO platform to address the existing and future needs of both the wireless and media broadcast industries.

Qualcomm supports the CEDB/OFTA efforts to release spectrum for new and innovative mobile TV/mobile multimedia services and offers the following comments in response to the issues raised in the consultation.

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<sup>3</sup> ITU-R Recommendation BT.1833 on "Broadcasting of multimedia and data applications for mobile reception by handheld receivers"; <http://www.itu.int/rec/R-REC-BT.1833/en>.

<sup>4</sup> In May 2007, ETSI approved a new work item, "Forward Link Only Air Interface Specification for Terrestrial Mobile Multimedia Multicast," aimed at the publication of an ETSI technical specification for MediaFLO; [http://webapp.etsi.org/WorkProgram/Report\\_WorkItem.asp?WKI\\_ID=25905](http://webapp.etsi.org/WorkProgram/Report_WorkItem.asp?WKI_ID=25905).

<sup>5</sup> [http://www.qualcomm.com/press/releases/2006/060908\\_signs\\_flo\\_chip.html](http://www.qualcomm.com/press/releases/2006/060908_signs_flo_chip.html).

<sup>6</sup> [http://www.qualcomm.com/press/releases/2007/070618\\_siano\\_sign\\_flo\\_print.html](http://www.qualcomm.com/press/releases/2007/070618_siano_sign_flo_print.html);  
[http://www.qualcomm.com/press/releases/2007/070723\\_telechips\\_sign\\_flo.html](http://www.qualcomm.com/press/releases/2007/070723_telechips_sign_flo.html).

## **I. Spectrum Availability**

**We welcome your views on the allocation of one multiplex in UHF Band and two multiplexes in Band III for the development of mobile TV services. We also welcome your views on the release of frequency spectrum in L Band and S Band for this purpose.**

### **UHF band:**

Qualcomm supports the CEDB/OFTA proposal to allocate UHF channel 47 (678-686 MHz) for mobile broadcast TV. Importantly, the UHF band has been recognized as prime spectrum for mobile multimedia broadcast services due to its favorable propagation characteristics, better antenna performance, superior mobility performance, and good in-building penetration characteristics. Network deployment in higher and lower frequency bands, while feasible, could significantly impact network economics. Within the UHF band, Band V or the upper UHF is viewed by industry as the optimum compromise between propagation and handheld antenna characteristics. Traditional TV services, which are not constrained by handheld antenna design limitations, would benefit from the lower propagation loss of the lower UHF band. Encouraging such band segmentation between fixed and mobile uses, to the greatest extent possible, will facilitate co-existence and minimize any potential for interference. In addition, single frequency network (SFN) configurations are recommended for mobile broadcast TV as they typically increase the coverage and capacity in comparison to a multiple frequency network (MFN) configuration. The signals received from the SFN of multiple transmitters combine at the handset increasing the effective signal strength and improving network reception. This reduces network cost or allows more content bearing channels to be supported. Most of the terrestrial mobile TV networks around the world are designed based on an SFN configuration.

The demand for mobile broadcast TV services is strong and growing, particularly in the Asia Pacific region. For example, there are currently more than 15 million mobile TV users in Asia, including both free and pay-TV models,<sup>7</sup> and mobile TV has achieved a much higher adoption rate in Asia relative to Europe.<sup>8</sup> Gartner estimates there will be an eightfold increase in the number of viewers over the next three years, from today's 60 million to 488 million by 2010. In addition, it has been recognized by some regulatory bodies, including Europe's Radio Spectrum Policy Group, that two national multiplexes would allow for competition, increase service offerings, and allow a greater choice for the consumer. While the user may not need or be able to access all of these channels, the wide diversity of the channel offerings will greatly increase the user's willingness to adopt the mobile TV service. Based on the forecasted subscriber demand and the benefits of competition to the consumer, we believe there is justification for allocating more than one UHF multiplex for mobile TV in Hong Kong when spectrum becomes available.

### **L-band:**

As stated above, mobile broadcast TV network deployment in higher frequencies such as the L-band, while feasible, can significantly impact network economics. Nevertheless, Qualcomm believes L-band should continue to be considered for mobile broadcast TV services in Hong Kong, particularly if sufficient spectrum in the UHF band is not auctioned and made available for deployment in the near term.

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<sup>7</sup> Cable & Satellite Broadcasting Association of Asia (CASBAA), "Mobile TV in Asia", January 2008.

<sup>8</sup> Mobile TV – Business Models & Opportunities, Screendigest, 3 December 2007.

## S-band:

Qualcomm believes the S-band, and in particular 2500 – 2570 MHz paired with 2620 – 2690 MHz, should be reserved for 3G services in Hong Kong, as this spectrum will be needed to sustain the fast market growth of 3G mobile broadband. Qualcomm's views on this frequency band have previously been conveyed to the TA in its BWA proceeding.<sup>9</sup> To reiterate, the 2.5 – 2.69 GHz ("2.5 GHz") band was identified by the International Telecommunications Union for IMT-2000/IMT at WRC-2000 and, in this regard, has been targeted for 3G / IMT-2000 expansion and will be needed to sustain anticipated market growth.<sup>10</sup> 3G technologies are currently providing advanced broadband data and voice services to more than 625 million subscribers worldwide.<sup>11</sup> We believe the 3G industry and eco-system will increasingly play a leading role in the provision of fixed and mobile 3G broadband services to the citizens of Hong Kong and other countries worldwide. Subscriber forecasts for 3G/IMT in the coming years are staggering, with industry analysts projecting that by 2011, there will be more than 1.4 billion 3G subscribers globally.<sup>12</sup> As 3G technologies continue to evolve (e.g., HSPA+, Long Term Evolution (LTE), Ultra Mobile Broadband (UMB)), they will require additional capacity, additional spectrum and large channel bandwidths in Frequency Division Duplex (FDD) mode. Access to the relatively wide bandwidth available from 2.5 – 2.69 GHz for the expansion of 3G and its technology evolutions will be necessary in order to benefit from these evolved technological capabilities and to deploy richer applications and services.

Qualcomm is committed to providing 3G chipset solutions that support the 2.5-2.69 GHz frequency band and plans to integrate support for the 2.5-2.69 GHz band into its entire HSPA/HSPA+ chipset portfolio. Qualcomm has already announced three chipset solutions that support HSPA/HSPA+ devices at 2.5-2.69 GHz. As licenses become available and operators deploy 3G networks in this band, Qualcomm will continue to launch additional chipsets supporting this band. In addition, the Company is working on next generation solutions based on OFDMA technologies and was the first in the industry to announce multimode chipset support for both LTE and UMB.<sup>13, 14</sup>

The 2.5 GHz band is particularly significant in that it represents an opportunity for the first truly harmonized global IMT band. Qualcomm, therefore, stresses the importance of harmonizing the 2.5-2.69 GHz band in accordance with the 3GPP/3GPP2 specifications. An excerpt of these specifications is included in Attachment 1 and indicates the band pairing of 2500 – 2570 MHz with 2620 – 2690 MHz and the need for a 120 MHz FDD duplex separation. The 2635 – 2660 MHz that CEDB/OFTA seeks comment on for use by CMMB or other purpose overlaps the FDD planned downlink from 2620 – 2690 MHz.

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<sup>9</sup> See Qualcomm submission in response to the TA's 3<sup>rd</sup> BWA consultation *Providing Radio Spectrum for Broadband Wireless Access Services: Third Consultation Paper* filed 18 July 2007.

<sup>10</sup> See ITU Radio Regulations **No. 5.384A** (Rev. WRC-07).

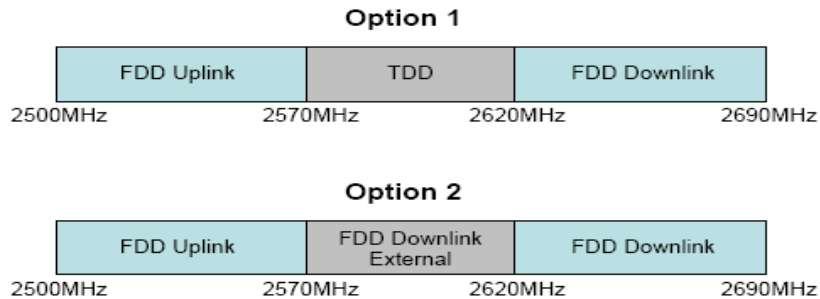
<sup>11</sup> Wireless Intelligence as of March 2008.

<sup>12</sup> Sources: CDMA2000 & WCDMA: Average of Informa, Strategy Analytics, Wireless Intelligence and Yankee Group subscriber forecasts.

<sup>13</sup> In March of 2007, Qualcomm announced the addition of an end-to-end solution for UMB to its roadmap, [http://www.qualcomm.com/press/releases/2007/070327\\_complete\\_solution\\_ultra.html](http://www.qualcomm.com/press/releases/2007/070327_complete_solution_ultra.html); On February 7, 2008, Qualcomm announced that it will begin sampling in the second quarter of 2009 a new portfolio of multimode chipsets - the standardization of which is expected by year-end. The MDM9xxx-series LTE chipsets include forward-compatibility with LTE and UMB standards-track specifications and backwards-compatibility with all leading 3GPP/3GPP2 standards: UMTS, HSPA+, UMB, and CDMA EV-DO Rev. B. The LTE chipsets support FDD/TDD modes and peak rates of up to 50/25 Mbps (down/uplink). See [http://www.qualcomm.com/press/releases/2008/080207\\_Qualcomm\\_to\\_Ship.html](http://www.qualcomm.com/press/releases/2008/080207_Qualcomm_to_Ship.html).

Harmonization of this band for terrestrial IMT will give users the opportunity to roam on different 3G/IMT networks in Hong Kong as well as other countries throughout the world while using the same handset and accessing the same services. Irrespective of what technologies or services may be deployed, a common and harmonized band plan facilitates economies of scale which in turn brings benefits to consumers.

There has been a great deal of work in various fora on developing and harmonizing a common band plan. For example, Europe (i.e., European Conference of Postal and Telecommunications Administrations- CEPT) has decided upon a harmonized band plan outlined in the Electronic Communications Committee (ECC) Decision (05)05 whereby FDD operations would use the outer 70 MHz of the 2500 – 2690 MHz band and the center 50 MHz gap from 2570 – 2620 GHz would be used for either TDD operations or external FDD downlinks (Figure 1). Also, the ITU has approved a recommendation ITU-R M.1036-3 which includes three different 2.5 GHz band channeling options, two of which are consistent with the European plan.<sup>15</sup> Qualcomm believes there are major advantages to the 70 MHz FDD / 50 MHz TDD or external FDD downlink / 70 MHz FDD band plan in that it provides separate band segments for FDD and TDD operations, maintains the 120 MHz duplex separation specified by 3GPP and 3GPP2, and would be consistent with the band plan expected to be used by many other countries around the world. Deviating from a common band plan will impact Hong Kong consumers as it may lead to the need for Hong Kong-specific handsets that would be difficult, if not impossible, to be used for roaming with other countries.



**Figure 1: Europe CEPT ECC Decision 05/05**

For these reasons, Qualcomm urges CEDB/OFTA to reserve the 2635 – 2660 MHz band for 3G fixed and mobile broadband usage. In addition, we encourage the Hong Kong government to develop coordination arrangements to protect 3G 2.5 GHz users in Hong Kong from potential interference from satellite usage of 2635 – 2660 MHz in Mainland China.

<sup>15</sup> ITU-R Recommendation M.1036-3, “Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications-2000 (IMT-2000) in the bands 806-960 MHz, 1 710-2 025 MHz, 2 110-2 200 MHz and 2 500-2 690 MHz.”

## **II. Spectrum Allocation**

**We welcome your views on whether the pro-mobile TV approach should be adopted, whereby at least 50% of the transmission capacity should be used to carry mobile TV content.**

Qualcomm does not have specific views on the percentage of transmission capacity that should be dedicated to mobile TV. Nevertheless, as detailed above, there is considerable demand for mobile broadcast TV services and Qualcomm supports the government adopting policies which will advance the development of these new and innovative services and give operators sufficient flexibility in launching these services. In addition to streaming and on-demand television, there are many other services and applications that can be provided over the same mobile broadcast platform. We believe the success of this new service in Hong Kong will be tightly coupled with the provision of value added services such as digital radio, IP datacast, and multimedia clip download services, e.g., traffic, emergency alert, news, weather, games, advertisements, etc.

## **III. Spectrum Assignment**

**We welcome your views on the adoption of market-based approach for the development of mobile TV services and the assignment of spectrum and the levy of Spectrum Utilisation Fee through auction.**

Qualcomm applauds and strongly supports CEDB/OFTA's market-based approach to the development of mobile TV services and the release of spectrum in Hong Kong. This approach has enabled Hong Kong consumers to benefit from state-of-the-art technology and services and solidified the Hong Kong government's reputation as a leading policy maker and regulator. CEDB/OFTA's approach has transformed Hong Kong into a regional business hub and incubator for new technology and services. We, therefore, urge the Hong Kong government to continue to adhere to its market-based policies.

With regard to standards for mobile broadcast TV, Qualcomm believes that a market-led approach and a clear spectrum strategy are vital to the successful long-term development of commercial mobile multimedia services. We support the principle of technology neutrality whereby no one technology is favored over another in policymaking. Technology neutral policies give operators the flexibility needed to deploy the mobile TV standard that best suits their business needs. As mobile TV is in the early stages of development, services will undoubtedly evolve to create effective solutions for the delivery of video content to consumers in ways that are most appropriate, cost effective and appealing. Much will depend on overall operator economics and spectrum availability rather than technology. A host of factors (e.g., price, availability, vendor support) influence a market stakeholder's decision to deploy a particular technology and ultimately meet consumer needs in terms of cost, choice of terminals, etc. We, therefore, believe a market-led approach is vital to the successful long-term development of commercial mobile TV services and urge CEDB/OFTA to ensure that various industry-recognized standards can be deployed.

Qualcomm firmly believes that appropriate spectrum allocation and regulation – rather than mandating standards – will ensure the development of successful business models and further enable the overall success of the mobile broadcast service market. With these factors emphasized, wide consumer adoption of these new services will follow.

With respect to the proposal to release spectrum via auction, Qualcomm supports this market-based approach as auctions have proven to be an effective method for assigning spectrum in a fair and efficient manner. A single national license for both the network and the service should be awarded through the auction process. In order to enable maximum flexibility while ensuring greater competition, a single multiplex license holder – possibly a consortium or joint venture of companies depending on market forces – should be in charge of deciding if commercial contracts with other stakeholders and/or third parties are required and appropriate. These types of decisions should be left to the market.

#### **IV. Licensing Arrangements**

**We welcome your views on the above two light-handed regulatory approaches, and your suggestions on which approach should be adopted for development of mobile TV.**

Promising services in their early stages of development require incentives for investment and innovation. This is particularly true for new markets such as mobile broadcast TV wherein significant investment in new infrastructure is required. Regulation has a key role to play in the successful adoption of these new services, and a timely launch of mobile broadcast TV services in Hong Kong can only be achieved if the licensing framework is pro-enterprise and flexible. Regulators can cultivate this process by ensuring fair market competition and undertaking all possible steps to mitigate potential risks and prevent market abuse. However, worldwide experience has shown that early regulation of new markets, in particular controls on entry, can stunt market growth, restrict services, raise prices and hurt quality.

Mobile broadcast TV will be offered via a new delivery platform which implies new and significant investment in network, content and devices. The Organization for Economic Co-operation and Development (OECD) has taken the position that “in view of the fact that mobile TV services are new and innovative, it is important that regulators tread lightly, and delay imposing broadcasting type obligations such as the protection of the public, the promotion of cultural diversity and pluralism of the media until it is clearly determined that they are necessary.”<sup>16</sup> Qualcomm shares this view and believes that diversity and pluralism of the media will be ensured by the market. We also feel it would be premature to apply legacy broadcasting regulations to new mobile broadcast TV services. The overarching goal of any new policy framework should be to drive market investment and innovation in order to provide incentives to mobile TV service operators to offer attractive services to consumers.

In light of the above considerations and benefits of ‘light-touch’ regulation, we fully support the CEDB/OFTA proposal that no ownership or cross-holding restrictions should apply to new mobile TV services.

One example of how flexible regulation has enabled new and innovative services to consumers is the MediaFLO mobile broadcast network deployment in the United States, which now serves 58 markets around the United States and which began over a year ago, well before analog TV stations will vacate the UHF band on February 17, 2009. Commercial launch of mobile TV services in the United States, prior to the 2009 date for analog shut-off, was only possible because of the flexible technical and service rules adopted by the Federal Communications Commission (FCC). MediaFLO USA, Inc. holds licenses covering the entire United States for Channel 55 (716-722 MHz), spectrum which was

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<sup>16</sup> See OECD, *Mobile Multiple Play: New Service Pricing And Policy Implications*, DSTI/ICCP/TISP(2006)1/FINAL, January 15, 2007, p. 6.

purchased at auction and then in a post-auction transaction in 2003-2004.<sup>17</sup> Transmitter power levels up to 50 kW ERP are permitted, which enable nationwide coverage at minimal infrastructure and cost. In many markets, TV stations are on this spectrum, but they will have to vacate the spectrum at the end of the digital TV transition, as noted above now set by law to occur on February 17, 2009. On that date, the spectrum will become available without restriction to the new licensees. Until then, the new licensees are allowed to use the frequencies provided they do not cause harmful interference to incumbent TV stations on the same or immediately adjacent channels. The FCC has set certain interference thresholds allowing the new licensees to cause low levels of interference not deemed to be harmful to the TV stations. In making this ruling, the FCC wrote with respect to MediaFLO that “we find it to be in the public interest for this innovative new service offering to be available to consumers.”<sup>18</sup>

The FCC TV/DTV interference protection criteria is set forth in Section 27.60 (a) of the FCC’s Rules and requires protection of co- and adjacent channel TV operations by ensuring minimum desired signal-to-undesired signal (D/U) ratios are met.<sup>19</sup> The existing planning methodology for DTV and analog interference planning was used. If the proposed transmitter’s signal level exceeds the D/U ratios, the number of people in the impacted areas would be tallied to determine whether the impact would be harmful.

The FCC went on to establish interference thresholds—as long as the interference from MediaFLO to a TV or DTV station predicted by OET-69 does not exceed the applicable threshold, the interference is permitted. The thresholds are as follows. For the period from October 13, 2006 through October 13, 2007, interference of up to 0.5% of the population covered over the air by TV or DTV station is permitted. From October 13, 2007 to October 13, 2008, interference of up to 1% of the population reached by a TV or DTV station is permitted. Finally, after October 13, 2008, interference of up to 1.5% of the population covered by a TV or DTV station is permitted. These thresholds were reached as a compromise by the FCC to achieve two important goals: minimizing interference to existing TV services and enabling the new mobile TV services to be deployed. The FCC concluded that this “measured approach” would serve the public interest. This same methodology can be used to compare the signal levels of an incumbent TV station and a mobile TV transmitter operating on the same channel in an adjacent market and/or on an adjacent channel in the same market (although the interference threshold may be adjusted as appropriate). The new licensees are even permitted to exceed the interference thresholds, if they have reached agreement with an affected TV station. Such agreements must be submitted to the FCC for approval, and the FCC has approved a number of these agreements between MediaFLO USA and affected TV stations.

As a result of these flexible regulations, MediaFLO USA is today using Channel 55 for its nationwide SFN mobile TV service based on FLO technology. Verizon Wireless began offering MediaFLO mobile TV services to its wireless customers in March 2007 and AT&T has announced plans to offer the services to its customers beginning May 2008.

We understand that CEDB/OFTA will soon develop technical rules to cover the new mobile broadcast TV services in Hong Kong and we strongly encourage CEDB/OFTA to recognize the need for flexibility in the development of these rules.

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<sup>17</sup> MediaFLO, USA, Inc. also acquired spectrum in Channel 56 (722 – 728 MHz) in 28 markets in FCC Auction No. 73, April 2008. This additional spectrum will provide greater flexibility to deliver additional content and services in these top markets, building on the Channel 55 spectrum for which Qualcomm already owns licenses, [http://www.qualcomm.com/press/releases/2008/080403\\_700MHz\\_Auction.html](http://www.qualcomm.com/press/releases/2008/080403_700MHz_Auction.html).

<sup>18</sup> In the Matter of QUALCOMM Incorporated, Order, 21 FCC Rcd 11683, 11697 (2006).

<sup>19</sup> See 47 C.F.R. Section 27.60 (a); [http://www.access.gpo.gov/nara/cfr/waisidx\\_06/47cfr27\\_06.html](http://www.access.gpo.gov/nara/cfr/waisidx_06/47cfr27_06.html).



Protection of or co-existence with co-channel TV operations in border areas with Mainland China would need to be governed through special bi-lateral coordination agreements between Hong Kong and Mainland China. Further clarification of these cross-border protection requirements will also be needed.

In Europe, mobile TV regulation is still fragmented amongst European Union member states, however, European regulators have recognized the need for a light-touch regulatory framework avoiding the application of traditional broadcast rules.

With respect to content to mobile devices, in view of the nascent nature of the mobile broadcast TV marketplace, we encourage the adoption of a “light-touch” approach. Self-regulatory industry codes of practice for regulating content to mobile devices have been adopted in a number of countries, including the United States and Australia, and we encourage the CEDB/OFTA to consider a similar approach for Hong Kong.<sup>20</sup>

In summary, Qualcomm supports a regulatory approach for new services that does not place overly restrictive requirements on stakeholders in terms of service provision, licensee eligibility, ownerships and/or partnerships. Taking into account the nascent and innovative status of the mobile TV market, the license requirements should be limited to interference management, coverage, quality of service, and content offerings.

#### **V. Access to Hilltop Transmission Sites and Geographical Coverage for Broadcast-type Mobile Television**

**We welcome your views on the requirement that mobile TV services should provide the same geographical coverage as free-to-air broadcasters.**

The regulatory environment in Hong Kong is such that the maximum ERP allowed is low at both hilltop transmission sites and non-hilltop transmission sites, compared to levels permitted in other countries. For this reason, it would be challenging to develop a cost-effective mobile broadcast network roll-out if it were not possible to transmit from the hilltop sites. Qualcomm, therefore, supports the CEDB/OFTA proposal for sharing of hilltop sites subject to commercial agreement yet giving CEDB/OFTA the power to intervene and adjudicate if mutual agreement cannot be reached.

#### **VI. Other – Development of Technical Rules for Mobile TV Services**

Qualcomm urges transparency and industry participation in the development of technical rules, e.g., transmitter power limits, adjacent channel protection requirements, for mobile TV services in Hong Kong. Importantly, CEDB/OFTA must ensure that the power levels allowed by mobile TV base station transmitters are appropriate for Hong Kong and allow for new and innovative mobile broadcast services to be brought to Hong Kong consumers in a cost-effective manner.

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<sup>20</sup> Cellular Telecommunications Industry Association (CTIA) in the United States helped industry to develop voluntary guidelines for classifying content provided over wireless handsets. These can be found at [http://www.ctia.org/consumer\\_info/service/index.cfm/AID/10394](http://www.ctia.org/consumer_info/service/index.cfm/AID/10394) and a reference to these guidelines and a further explanation can be found at the FCC’s website, <http://www.fcc.gov/cgb/consumerfacts/protectingchildren.html>. It is also worth noting that a number of respondents to the Singapore MDA’s recent mobile TV consultation also advocated an industry self-regulatory approach.

## VII. Conclusion

Qualcomm appreciates this opportunity to provide comments on the CEDB/OFTA's Public Consultation on *Second Consultation on Development of Mobile Television Services*. Qualcomm supports the CEDB/OFTA's efforts to develop a market-driven, light-touch and pro-enterprise regulatory framework that will attract more players to the mobile broadcast TV market as well as encourage innovation and competition. We also applaud the CEDB/OFTA for adhering to Hong Kong's long standing policy of technology neutrality and extending it to mobile broadcast TV standards. Qualcomm firmly believes that spectrum availability, continued technology neutrality and a market-led approach will spur investment and innovation critical for the ultimate success of the mobile broadcast TV market in Hong Kong.

Should you have questions, please do not hesitate to contact me at < +852 2537 5000 > or < juliewelch@qualcomm.com >.

Sincerely,

A handwritten signature in blue ink that reads "Julie Garcia Welch". The signature is fluid and cursive, with the first name "Julie" being the most prominent.

Julie Garcia Welch  
Director, Government Affairs  
Southeast Asia & Pacific

cc: Edmund Sin, Vice President, Business Development Qualcomm International, Inc.  
May Oh, Senior Director, Business Development, MediaFLO Technologies, Qualcomm International, Inc.

**Attachment 1**

**Excerpts from 3GPP and 3GPP2 Specifications for the 2.5 – 2.69 GHz Band**

3GPP TS 25.101 V7.6.0 (2006-12)

5.2 Frequency bands

a) UTRA/FDD is designed to operate in the following paired bands:

**Table 5.0: UTRA FDD (WCDMA/HSPA) frequency bands**

<i>Operating Band</i>	<i>UL Frequencies UE transmit, Node B receive</i>	<i>DL frequencies UE receive, Node B transmit</i>
<i>I</i>	1920 - 1980 MHz	2110 -2170 MHz
<i>II</i>	1850 -1910 MHz	1930 -1990 MHz
<i>III</i>	1710-1785 MHz	1805-1880 MHz
<i>IV</i>	1710-1755 MHz	2110-2155 MHz
<i>V</i>	824 - 849 MHz	869-894 MHz
<i>VI</i>	830-840 MHz	875-885 MHz
<b>VII</b>	<b>2500-2570 MHz</b>	<b>2620-2690 MHz</b>
<i>VIII</i>	880 - 915 MHz	925 - 960 MHz
<i>IX</i>	1749.9-1784.9 MHz	1844.9-1879.9 MHz
<i>X</i>	1710-1770 MHz	2110-2170 MHz

b) Deployment in other frequency bands is not precluded

5.3 TX-RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation

**Table 5.0A: TX-RX frequency separation**

<i>Operating Band</i>	<i>TX-RX frequency separation</i>
<i>I</i>	190 MHz
<i>II</i>	80 MHz
<i>III</i>	95 MHz
<i>IV</i>	400 MHz
<i>V</i>	45 MHz
<i>VI</i>	45 MHz
<b>VII</b>	<b>120 MHz</b>
<i>VIII</i>	45 MHz
<i>IX</i>	95 MHz
<i>X</i>	400 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

**3GPP2 CS0057-B**

*CS0057-B defines 120MHz duplex separation for CDMA2000 FDD in Band Class 13.*

**Table 2.1.14-1. Band Class 13 Block Frequency Correspondence**

<b>Block Designator</b>	<b>Transmit Frequency Band (MHz)</b>	
	<b>Mobile Station</b>	<b>Base Station</b>
A	2500–2505	2620–2625
B	2505–2510	2625–2630
C	2510–2515	2630–2635
D	2515–2520	2635–2640
E	2520–2525	2640–2645
F	2525–2530	2645–2650
G	2530–2535	2650–2655
H	2535–2540	2655–2660
I	2540–2545	2660–2665
J	2545–2550	2665–2670
K	2550–2555	2670–2675
L	2555–2560	2675–2680
M	2560–2565	2680–2685
N	2565–2570	2685–2690