

**Consultation on Digital Broadcasting :  
Mobile Television and Related Issues**

**Communications and Technology Branch  
Commerce, Industry and Technology Bureau  
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We seek your views on the introduction and regulation of mobile TV services. Please send your comments to the Communications and Technology Branch of the Commerce, Industry and Technology Bureau by **25 April 2007** by any of the following means:

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# **DIGITAL BROADCASTING: MOBILE TELEVISION AND RELATED ISSUES**

## **Executive Summary**

The rollout of mobile television (mobile TV) is gaining momentum in the world. Various competing mobile TV technologies have already emerged for commercial deployment. We are seeing the introduction of commercial services in some overseas market such as the UK and South Korea, and trials in others with a view to full-scale commercialization. There is clear interest in Hong Kong and some local operators are indeed carrying out technical trials of mobile TV in Hong Kong.

2. We need to facilitate the launch of mobile TV services in Hong Kong so as to promote investment, innovation and competition for the benefits of the consumers and the further development of Hong Kong's communications market. We are now seeking views from the public and industry on the introduction and regulation of mobile TV services with respect to the four main regulatory aspects, namely, spectrum availability, spectrum allocation, spectrum assignment and licensing arrangements. We would also like to take this opportunity to revisit certain regulatory arrangements with regard to the implementation of commercial digital terrestrial television (DTT) and digital audio broadcasting (DAB) services in Hong Kong, in the light of relevant market experience and given that they may compete with mobile TV services for radio spectrum.

3. Specifically the matters for consultation are summarized below:

- (a) *Spectrum availability* – whether the frequency spectrum available in Band III (174MHz – 230MHz) and L Band (1466MHz – 1480MHz), as well as the two single frequency network multiplexes in the UHF Band (470MHz – 806MHz) originally reserved under the current policy framework of DTT, should be made available for mobile TV services or other digital broadcasting services;

- (b) *Spectrum allocation* – whether we should adopt a service-neutral approach by allowing spectrum users to decide on their own which digital broadcasting services should be launched, a conventional approach by allocating frequencies to specific uses of DTT, DAB and mobile TV respectively, or a pro-mobile TV approach by allocating frequencies primarily for mobile TV purpose but also allowing other services to run as ancillary services;
  
- (c) *Spectrum assignment* – whether we should adopt a market-led approach where the available frequencies should be assigned by auction with appropriate rollout obligations, and whether a spectrum utilization fee should be charged for such uses; and
  
- (d) *Licensing arrangements* - whether mobile TV programme services should be licensed and regulated under the Broadcasting Ordinance.

4. The Government also intends to gauge the level of market interest in launching mobile TV and other digital broadcasting services through separate invitation for expression of interest from bodies and organizations in bidding for the relevant spectrum.

5. Subject to the outcome of this consultation, the Government will work out a draft implementation framework for introducing mobile TV for a second round of consultation.

## **A. MATTERS FOR CONSULTATION**

Digital technology continues to offer business opportunities for the broadcasting and telecommunications market. An important aspect is the development of mobile television (mobile TV) services through the availability of mobile multimedia services on small display devices. These services exemplify technological and media convergence. They have already been commercially launched in jurisdictions such as the UK and South Korea; and trial services are planned or have been launched in many parts of the world. Some local broadcasters and telecommunications operators are also conducting technical trials on mobile TV in Hong Kong.

2. We have been keeping track of this development and would like to consult the public and industry on the introduction and regulation of commercial mobile TV services in Hong Kong. In this context we would focus on four major regulatory aspects:

- Spectrum availability
- Spectrum allocation
- Spectrum assignment
- Licensing arrangements

3. Given the market experience of digital audio broadcasting (DAB) services internationally in recent years and to the extent that mobile TV services may compete with digital terrestrial television (DTT) and DAB services for radio spectrum for service delivery, we would also like to take this opportunity to revisit certain regulatory arrangements with regard to the implementation of commercial DTT and DAB services in Hong Kong.

## **B. BACKGROUND**

4. In December 2003 the Government issued a public consultation document<sup>1</sup> on the introduction of DTT in Hong Kong. Following this public consultation exercise the Government announced in July 2004 the arrangements for the implementation of DTT. The same public consultation document also stated the Government's views on the future of commercial DAB services in Hong Kong.

## **C. POLICY BACKDROP**

5. The Government's policy objective is to enhance Hong Kong's position as a regional communications hub. We aim at harnessing the opportunities afforded by technological development and creating an enabling environment that promotes innovation, investment and competition for the benefit of consumers. In this endeavour we are guided by the well-established "market-led" and "technology-neutral" principles. Essentially we leave it to the market to assess the business and technological opportunities and risks and take investment decisions accordingly.

6. The recently published public consultation document on spectrum policy review<sup>2</sup> also proposes as a guiding principle to use a market-led approach in spectrum management when there are competing commercial demands for spectrum. This should generally lead to the most economically and technically efficient, and hence most valuable, use of spectrum. Issues pertaining to spectrum availability, allocation and assignment are discussed in paragraphs 19 to 39 below.

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<sup>1</sup> Entitled "Second Consultation on Digital Terrestrial Broadcasting in Hong Kong" published by Commerce, Industry and Technology Bureau (CITB) in December 2003.

<sup>2</sup> Entitled "Consultation Paper on Proposed Spectrum Policy Framework" published by CITB in October 2006.

## **D. DIGITAL BROADCASTING: AN OVERVIEW**

### (a) Mobile TV

*What is Mobile TV?*

7. As a general term, mobile TV refers to the wireless transmission of video for reception on the move by mobile or portable devices. The defining characteristics distinguishing it from traditional television services are mobility and personalized consumption through mobile terminals such as mobile phones or other hand held terminals. Mobile TV in the form of video-on-demand or video streaming is already available in Hong Kong on the 2.5G or 3G mobile telecommunications platform, supporting mainly point-to-point transmission with limited transmission capacity<sup>3,4</sup>. Mobile TV services of this kind require no extra spectrum to support them.

*Technological development*

8. On the other hand, competing point-to-multipoint, high transmission capacity technologies have been developed potentially as a new mode of broadcasting services over mobile TV. Competing mobile TV technologies in a more mature state of development require the assignment of spectrum to support their services. They include:

- DVB-H. This is a member of the European DVB broadcasting standards<sup>5</sup>. A multiplex (a frequency band for digital transmission) using DVB-H in the UHF band can carry about 30 mobile TV channels for 7-inch displays.
- T-DMB (Eureka 147). T-DMB refers to a variant application of the Eureka 147 technical standard originally developed for DAB. The development of this technology, conducted in South Korea, optimizes the potential of Eureka 147 into a broadcasting technology for transmitting mobile multimedia services, instead of just DAB, which is less attractive to consumers. A 1.5 MHz multiplex using T-DMB (Eureka 147) in Band

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<sup>3</sup> One mobile operator is offering mobile TV service based on a proprietary point-to-multipoint transmission standard.

<sup>4</sup> A new technology, known as Multimedia Broadcast Multicast Service (MBMS), is also designed to operate over the 3G platform, but the timing for availability of equipment is still uncertain.

<sup>5</sup> DVB-T standard for DTT is widely adopted internationally.

III or L Band can carry two to three mobile TV channels for 7-inch displays.

- S-DMB. This is a technology for transmitting mobile multimedia services to handhelds via geostationary satellite and terrestrial networks. Japan and South Korea launched an S Band satellite in 2004, followed by S-DMB based services in October 2004 and May 2005, respectively.
- MediaFLO. Qualcomm, a US company that specializes in wireless technologies, develops this. It is designed to reinforce mobile phone technologies to support high capacity video transmission.
- Other mobile TV broadcasting technologies, such as ISDB-T in Japan, DAB-IP in the UK and a new standard, namely China Mobile Multimedia Broadcasting (CMMB), promulgated by the State Administration of Radio, Film and Television in Mainland.

We welcome advice on other emerging mobile technologies that support video transmission services and what forward planning the Government should take to facilitate the deployment of such technologies in Hong Kong.

#### *The opportunities*

9. Mobile TV exemplifies multimedia convergence. It is by nature a personalized, outdoor media that has distinct commercial appeal given its convenience and mobility. It spawns opportunities for content creation - and enables business synergy where content produced for traditional transmission platforms could be repackaged at relatively low marginal costs for additional distribution on the mobile platform. It may, for example, give rise to a new business sector of tailor made content production for mobile TV (e.g., lunch-time short duration quiz show dedicated for mobile TV audience in South Korea). It may generate other value-added activities, e.g. a new sector of mobile TV advertising targeting a specific market segment. All in all it has all the promises to enrich the value chain of the communications market through new business and revenue models.

*International experience and local interest*

10. The launch of mobile TV is a worldwide phenomenon. South Korea is the forerunner and launched commercial T-DMB terrestrial mobile TV services in December 2005. It has already hit the mark of having over 1.4 million subscribers. Japan, Italy and the UK already started the commercial rollout of mobile TV in 2006. Operators across the world in Australia, France, Germany, Spain, Singapore, the USA, the Mainland of China, etc, have commenced some form of trial schemes to test the feasibility of various technologies for mobile TV and are enthusiastic to launch commercial mobile TV services as soon as possible.

11. In Hong Kong, broadcasters and telecommunications operators have also indicated their interest in launching mobile TV services as a value-added service in their own business, and some have already been testing various point-to-multipoint mobile TV technologies in the local environment. Mobile operators have also commenced to provide mobile TV services in the form of video-on-demand or video streaming on their 2.5G or 3G platform.

12. A snapshot of the situation all over the world is at **Annex**.

We welcome views and information on the trial or rollout of mobile TV services in other parts of the world and comments on the risks and opportunities afforded by mobile TV services for Hong Kong's communications industry and market.
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(b) DAB

13. DAB generally refers to broadcasting sound contents in the digital format. It could be transmitted via the Internet, satellite, coaxial cable and broadband networks. However, very often DAB specifically refers to digital terrestrial sound broadcasting. The European technical standard, Eureka 147 (see paragraph 8 above), is the most widely adopted and its feasibility for Hong Kong was affirmed in 1999. DAB offers benefits such as better sound quality, interference immunity, and more broadcasting channels.

*Government's position*

14. The Government proposed in the public consultation conducted in 2000 on digital terrestrial broadcasting that the introduction of DAB services into Hong Kong should be market-led and interested parties might be assigned frequencies for DAB trials. In the second public consultation conducted in late 2003 and early 2004, the Government reiterated the market-led approach, and proposed “parties interested in launching digital radio services may apply for the approval of the Telecommunications Authority (TA) to roll out trial services. Also, since broadcasters in some overseas countries (e.g., the UK) use Band III frequencies for DA broadcasting, the TA will consider, subject to spectrum availability, applications for using Band III frequencies for DA broadcasting.”<sup>6</sup>

15. Respondents generally supported the Government's position in these two rounds of public consultation.

*International experience*

16. The international experience in the rollout of DAB is, however, not entirely positive. Digital radio services based on the Eureka 147 technical standard have been launched in Europe for some time. Except in the UK where the penetration has reached about 11% after more than 10 years of active promotion, market responses elsewhere are not encouraging. Some Nordic countries have, for example, decided to terminate or pull back further investment in DAB in 2005. Finland switched off their DAB transmitters in 2005, and is now considering providing digital radio via other digital broadcasting systems such as DVB-H. In Sweden, the Government has put DAB on hold and tasked the regulator to evaluate techniques for digital radio with a yearly report in 2006, 2007 and 2008. We also note that the international focus appears to have shifted to the inclusion of digital radio and datacasting as ancillary services to mobile TV. The notable example is South Korea, where one T-DMB service comprises 1 mobile TV channel, 3 digital radio channels and 1 data channel on each multiplex. The international non-governmental organisation which defines digital audio broadcasting standards has recently changed its name from the WorldDAB Forum to WorldDMB Forum, which manifests the

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<sup>6</sup> Paragraph 37, Second Consultation on Digital Terrestrial Broadcasting published by CITB in December 2003.

world's trend of moving towards mobile multimedia broadcasting<sup>7</sup>.

### *Limitations of DAB*

17. This situation is a reflection of the use of digital terrestrial radio as a supplement, not replacement, of existing FM analogue services. Apart from better sound quality or more service channels<sup>8</sup>, DAB services do not appear to add significant value to consumer benefits that justify or motivate the take-up of digital receivers, the price of which, though dropping, is still much higher than that of analogue receivers. In this context, the content experience for consumers remains limited to essentially sound broadcasting services, compared to other platforms that make more interesting offerings in terms of quality and diversity of contents and personal experience. DAB is thus quite different from DTT, where high-definition picture quality, distinctly better reception, availability of interactive services and more television channels are discernable features enticing consumers to switch over from analogue to digital reception.

### (c) DTT

18. Following public consultation, the Government announced in July 2004 a policy framework on the introduction of DTT in Hong Kong. *Inter alia*, the framework includes the following elements:

- Asia Television Limited (ATV) and Television Broadcasts Limited (TVB) start simulcasting their existing television services in analogue and digital formats within 2007 at the latest.
- We aim to switch off analogue broadcasting in five years after the commencement of simulcast, subject to further market study and analysis.
- We adopt a market-led approach in selecting the technical standard for DTT. The Mainland promulgated a national standard in August 2006. Both ATV and TVB proposed in late December 2006 that they would

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<sup>7</sup> In October 2006, the WorldDAB Forum announced a change in name to WorldDMB Forum (Digital Multimedia Broadcasting) to show that its objectives cover radio, mobile TV and the broadcasting of new media services and not just the DAB services.

<sup>8</sup> In the UK, there are criticisms that transmission on DAB is more expensive than on FM. Broadcasters therefore carry more channels within their transmission capacity, resulting in the sound quality of DAB inferior to that of analogue FM.

adopt the national standard for digital broadcasting.

- Out of the five multiplexes available in Hong Kong, ATV and TVB shall share the one based on multiple frequency network (MFN) configuration for broadcasting their existing programme channels in digital format during the simulcast phase. Each of them will take up one additional multiplex based on single frequency network (SFN) configuration for new high- definition broadcasting services.
- Additional services (notably datacasting) on the multiplexes are permissible but shall not exceed 25% of the transmission capacity of a multiplex.
- The remaining two SFN multiplexes will be assigned at a later stage after ATV and TVB have confirmed the technical feasibility of the SFN configuration.

## **E. SPECTRUM AVAILABILITY**

19. The introduction of mobile TV services with point-to-multipoint, high transmission capacity technologies inevitably requires the availability of suitable spectrum (see paragraph 8 above). There may be conflicts and competition for spectrum allocation among mobile TV services, other digital broadcasting services and telecommunications services (such as datacasting, broadband wireless access, point-to-point communications between wireless camera equipment, etc) when they operate in the same frequency bands. The following analysis sets out the availability of spectrum not just for mobile TV deployment, but also for DTT service, DAB service and, where relevant, other telecommunications services.

20. Four frequency bands have been identified for the introduction of digital broadcasting services:

- Band III
- L Band
- UHF Band
- S Band

(a) Band III (174MHz – 230MHz)

21. Four multiplexes providing 12 channels for mobile TV services<sup>9</sup> based on the existing T-DMB technology may be identified for launching mobile TV within Band III in Hong Kong. Many operators overseas use this band for technical testing and trial services based on T-DMB technology and its variants such as DAB-IP. Many consumer products are designed for receiving signals transmitted in this band. DAB may also use the designated frequencies in Band III to provide 28 channels for sound broadcasting services. This band in Hong Kong will be available shortly after coordination with the Mainland authorities to avoid mutual interference.

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<sup>9</sup> Based on existing T-DMB and DAB technologies, one multiplex (1.54MHz) in Band III or L Band may carry some 7 CD-quality audio channels or 2-3 mobile TV channels.

(b) L Band (1466MHz – 1480MHz)

22. Eight multiplexes may be identified in this frequency band for the provision of providing 24 channels for mobile TV services based on T-DMB technology. On the other hand, DAB may use the designated frequencies in the L Band for the provision of 56 channels for sound broadcasting services. Currently, few countries have used this band for mobile TV services, though we note that an operator in the US has launched a commercial trial of mobile TV based on DVB-H technology in New York City after years of technical trials. L Band is also not commonly used for DAB in overseas jurisdictions for the time being. It is uncertain that there is a critical mass supporting large-scale production of consumer products readily available for receiving signals in this band.

(c) UHF Band (470MHz – 806MHz)

23. DVB-H and MediaFLO technologies (see paragraph 8 above) operate in UHF Band. However, the scope for deploying these technologies for mobile TV services is practically ruled out at this stage unless the current policy framework on DTT is revisited. At present there are four SFN multiplexes<sup>10</sup> in UHF Band that can be used for either DTT or mobile TV. ATV and TVB have each been assigned a SFN multiplex for DTT broadcasting to be launched in 2007 (see paragraph 18 above). The disposal of the remaining two SFN multiplexes will be decided after ATV and TVB have confirmed the technical feasibility of SFN technologies.

(d) S Band (2500MHz – 2690 MHz)

24. The S-DMB services of South Korea and Japan operate in the sub-band of 2630-2655 MHz in S Band. The satellite mobile TV technologies of the Mainland under development will also operate in S Band and will initially occupy a bandwidth of 25 MHz.

25. In Hong Kong, the band of 2500 – 2690 MHz is currently allocated as the expansion band for 3G mobile services, which is in accordance with the recommendations of the International Telecommunication Union (ITU). We note that the World Radiocommunication Conference 07 (WRC-07), which will be held in late October 2007 in Geneva, will discuss the technical criteria for the operation of broadcasting satellite services and broadband wireless access services in this band.

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<sup>10</sup> SFN multiplex has a bandwidth of 8 MHz.

This will have an impact on the use of S Band in Hong Kong because the operation of broadcasting satellite services may cause interference to 3G mobile services or broadband wireless access services to be operated in S band in Hong Kong. The use of S Band for mobile TV in Hong Kong can only be assessed after WRC-07.

26. An overview of the availability of spectrum for the three digital broadcasting services in question can thus be summarized schematically as follows:

	Mobile TV	DTT	DAB
Band III	T-DMB, DAB-IP	×	✓
L Band	T-DMB, DAB-IP and DVB-H	×	✓
UHF	DVB-H MediaFLO	DVB-T or National standard <sup>11</sup>	×
S Band	Assessment to be made after WRC-07		

We welcome comments on the above analysis of spectrum availability for digital broadcasting services. In particular, we invite comments on whether the spectrum in Band III and L Band and two SFN multiplexes in the UHF Band should also be made available for mobile TV services, subject to review of the spectrum allocation and assignment arrangements.

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<sup>11</sup> ATV and TVB proposed they would adopt the national standard for DTT.

## **F. SPECTRUM ALLOCATION**

27. It can be seen from the above that the allocation of spectrum for commercial mobile TV services is clearly subject to the following major considerations:

- Policy decision to introduce new services based on the market-led and technology-neutral principle and having regard to the Government's policy objectives
- Technology fit for frequency deployment
- Competing demands for the same frequency band by different technologies and services where this is relevant
- Opportunity costs associated with choices of service, if indeed they have to be taken in the face of competing demands
- Planning considerations, where applicable, for the deployment of spectrum to meet future needs over time

28. It can also be seen from the analysis on spectrum availability that there are three sources of potential competition for spectrum allocation as far as digital broadcasting services are concerned.

- Band III for mobile TV and DAB uses. There appear two main approaches. The UK, the forerunner of DAB, developed DAB first in Band III and mobile operators later launched mobile TV using DAB-IP technologies atop it. On the other hand, South Korea has allocated this band for mobile TV based on T-DMB, and digital radio runs as an ancillary service of mobile TV. Arguably, Hong Kong does not have a legacy issue as we have not commenced either mobile TV or DAB.
- L Band for mobile TV and DAB uses. When the UK consulted the industry on its recent plan of releasing L Band later this year, business operators show preliminary interests in launching different digital broadcasting services in this band: mobile TV based on DVB-H or T-DMB technologies, DAB or digital satellite radio. But as noted in paragraph 22 above, the current prospect of the broadcasting industry to deploy this frequency band for mobile TV services has not been established and therefore the extent of possible conflict between it and other digital broadcasting services is difficult to predict at least for the

time being.

- As mentioned in paragraph 23, there are two unassigned SFN multiplexes. Both future DTT services and mobile TV services that deploy the DVB-H or MediaFLO standards will compete for these remaining SFN multiplexes. DVB-H/MediaFLO technology will not stand a chance of commercial deployment in Hong Kong if the 2004 policy framework on DTT that has reserved the remaining two unassigned SFN multiplexes is not reviewed in the light of the latest digital developments.

29. Against this background, we propose three options for spectrum management and allocation purposes that may serve the two objectives of facilitating broadcasting development and reconciling competing demands in this process to optimize the economic and efficient use of spectrum resources. These options are not necessarily mutually exclusive.

(a) A service neutral approach

30. We will make available the requisite frequency bands from time to time according to the proposed spectrum release plan<sup>12</sup> and leave it to the investors to decide on the services, viz. mobile TV, DTT and DAB, they want to provide, as well as the technologies they want to deploy for service delivery. The pros and cons of a service-neutral approach are as follows:

*Pros:*

- This arrangement removes the need for subjective allocation of spectrum resources for different digital broadcasting services.
- Coupled with spectrum assignment through auction (see paragraphs 34 to 36), it provides the highest latitude for a market-led approach.
- Arguably it is a straightforward and efficient approach for spectrum allocation, leading to the most economic and efficient use of spectrum, being valuable public resource.

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<sup>12</sup> In the Consultation Paper on Proposed Spectrum Policy Framework published by CITB in October 2006 (footnote 2), we have proposed that the TA should publicize spectrum release plans showing the intended supply of spectrum through open, competitive processes in the following three years.

*Cons:*

- If spectrum assignment is through an auction process with the successful bids judged on price offering, the outcome may preclude some digital broadcasting services.
- The method of assignment has to take into account the treatment of bids for entirely different services, if there are considerations such as obligations for rolling out a particular service to be included in the spectrum assignment exercise.
- Interference prevention would be more challenging as different types of services may be operated in adjacent blocks of spectrum. The requirement of guard bands between frequency blocks of various services will reduce the efficiency of the spectrum utilization.
- The above points to a need for careful review of opportunity costs, financial or otherwise, forgone.

(b) A conventional approach

31. We will earmark, within the available frequency bands, segments for mobile TV, DAB and DTT services where relevant and applicable and assign them accordingly. The pros and cons of this approach are as follows:

*Pros:*

- This will give more certainty to the market in terms of spectrum availability and allocation for different digital broadcasting services.
- It may give opportunities for different services to compete for spectrum resources, even if certain services may be less commercially favourable.
- Arguably, the spectrum assignment and pricing consideration and process relating to specific individual services (e.g. rollout obligations) may be more straightforward.
- Interference prevention would be more straightforward. Spectrum efficiency can be maximized.
- This arrangement is still consistent with a market-led and technology neutral approach for introduction of a particular service.

*Cons:*

- This approach entails some subjective elements in the allocation arrangement, especially when there are competing demands for different services for a specific frequency band.
- This is particularly the case in the use of the UHF Band for services other than DTT as provided under the 2004 DTT policy framework.

(c) A pro-mobile TV approach

32. We note that mobile TV is the favourite use for spectrum available in the bands identified in paragraph 20 above in many parts of the world. We have also noted the relatively unsatisfactory rollout of DAB internationally, the limitations of standalone DAB services, and the market trend to include digital radio services and other value added services such as datacasting as ancillary services to mobile TV services (see paragraphs 16 and 17). It is therefore for consideration whether we should follow the market trend to allocate the spectrum primarily for mobile TV services. Thus, instead of providing DAB services on their own, we should put DAB and indeed other services such as datacasting as ancillary services to mobile TV services. This means that when introducing mobile TV services, these successful bidders of the spectrum may also, either on their own or allowing others to do so, use some of the spectrum to operate DAB and other services. The pros and cons of this approach are as follows:

*Pros:*

- This arrangement has regard to the current state – and trend – of deployment of DAB services.
- Arguably it will lead to a tidier arrangement for spectrum management purposes and more efficient and economic use of spectrum resources than the conventional approach.
- Arguably it may also promote the rollout of DAB and other value added services by bundling them with mobile TV service, taking into account world trend and local circumstances.

*Cons:*

- By removing the option of providing DAB services on their own, it may go against the spirit of a market-led approach for introduction of DAB in Hong Kong. The future of digital radio services is not yet totally conclusive and the interest in launching them in Hong Kong has not been fully tested at this stage.

We invite comments on the approach to allocate spectrum resources for the three digital broadcasting services in question. We also welcome any suggestions other than the above three proposed options.

## **G. SPECTRUM ASSIGNMENT**

### *The general principle*

33. In the Consultation Paper on Proposed Spectrum Policy Framework published by the Commerce, Industry and Technology Bureau in October 2006, it is proposed that “as a published guiding principle under the spectrum policy framework, the TA should use market-based approach in spectrum management when there are competing commercial demands for the spectrum, unless there are overriding public policy reasons to do otherwise” and “in the context of spectrum assignment, this guiding principle would mean that auctions should always be used when there are competing commercial demands for spectrum”<sup>13</sup>.

### *Assignment through auction*

34. We expect that in Hong Kong, there would be competing demands for spectrum for mobile TV services, and possibly other digital broadcasting services as well<sup>14</sup>. We propose that regardless of the option selected for spectrum allocation purposes (see the preceding section of this document), spectrum for commercial mobile TV and other digital broadcasting services should be assigned by auction, which is a fair and efficient method to assign spectrum to the applicants with the best business case. Indeed an auction arrangement is not new in Hong Kong.

35. In the most recent exercise when spectrum for a new major public radiocommunications service, i.e., 3G mobile services (including mobile multimedia services) was released in 2001, the Government also assigned the spectrum by way of auction. Similarly, in the CDMA Consultation Paper issued by the TA in October 2006, it is also proposed that auction will be deployed for the assignment of spectrum to the market to enable the provision of mobile services using CDMA standards.

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<sup>13</sup> Paragraphs 36 and 37 of CITB public consultation document.

<sup>14</sup> In South Korea, spectrum for mobile TV services was assigned by a merit-based tender exercise. In the US, the spectrum for launching mobile multimedia services based on the MediaFLO technology was awarded through auction. In the UK, Ofcom, the regulator, decided in March 2006 to auction frequencies in L Band (1452-1492 MHz) for a range of wireless communications and mobile multimedia services on a service-neutral approach.

*The proposed auction process*

36. One possible arrangement is to make reference to the exercise of auctioning spectrum for 3G mobile services, held in 2001. Applicants for the auction will be required to submit certain information for assessing whether they are qualified for participating in the auction (i.e., pre-qualification exercise). The pre-qualification criteria are intended to be relatively light but should involve setting certain minimum requirements on the financial and technical capabilities of the applicants. If the conventional or pro-mobile TV approach is adopted in the allocation of spectrum, rollout obligations will be incorporated into the conditions for the auctioning and assignment of spectrum. In the case of mobile TV services, this may include the minimum number of mobile TV channels to be offered, the coverage of mobile services and/or the percentage of assigned spectrum that must be used for mobile TV purpose.

*Spectrum utilization fee (SUF)*

37. The TA is empowered by the Telecommunications Ordinance (TO) (Cap. 106) to allocate and assign spectrum. Pursuant to section 32I of the TO, the TA may by order designate the frequency bands in which the use of spectrum is subject to the payment of spectrum utilization fee (SUF) by the users of the spectrum, subject to consultation with the telecommunications industry and such persons who may be directly affected. The Secretary for Commerce, Industry and Technology (SCIT) may by regulation prescribe the level of SUF or the method for determining such fees, which includes auction. So far, SUF is only applicable to the spectrum for 3G mobile services auctioned in 2001, and spectrum for second-generation mobile services when those licences were renewed in 2005 and 2006.

38. As explained in the CITB public consultation document on spectrum policy review, SUF serves a few purposes:

- It acts as a financial tool to manage competing commercial demand for spectrum. Spectrum that can create more value for spectrum users should be able to attract higher fees through an open, competitive process such as auction.
- It enables the community to reap the benefits from the commercial use of a public resource.

- Arguably spectrum users who are bestowed the right to use the spectrum for a period of time, hence denying other users of access to that part of the spectrum should likewise pay for the use of the spectrum.

39. Subject to the outcome of this consultation, auction rules, rollout obligations and applicable methods for charging SUF will be developed for further consultation with the public and industry.

We invite comments on whether, in pursuance of a market-led approach, we should assign the spectrum available in Band III and L Band and the two SFN multiplexes in the UHF Band for relevant digital broadcasting services by auction with appropriate rollout obligations, and whether a SUF should be charged for such uses.

## **H. LICENSING ARRANGEMENT**

### *The existing regime*

40. The existing licensing regimes in respect of television services and sound broadcasting services, respectively, are as follows:

- Television services. The regime distinguishes between network carriage (infrastructure) and provision of television programme services (content). Thus, an operator of a transmission network requires the relevant carrier licence under the TO. A provider of television programme service requires a licence under the Broadcasting Ordinance (BO) (Cap. 562). A television service provider may operate its own network with both a carrier licence and a television programme service licence, or it can engage a licensed operator to transmit its service and needs a television programme service licence only. Similarly, a network operator can specialize in establishing, maintaining and leasing network capacity and needs a carrier licence only.
- Sound broadcasting services. This is governed solely by Part IIIA of the TO and unlike the licensing arrangement for television services, a sound broadcasting licence covers both the carrier and programme services aspects.

41. The existing licensing arrangements will remain in force in respect of the following services:

- DTT services will continue to be regulated by the existing licensing arrangement under the TO for network carriage and the BO for programme services, as in the case of ATV and TVB (see the preceding paragraph).
- DAB services, either on their own or as value added services ancillary to mobile TV, will continue be regulated by the existing licensing framework governing sound broadcasting services under Part IIIA of the TO as in the case of existing analogue sound broadcasting services (see the preceding paragraph).
- Ancillary datacasting services will be licensed as public non-exclusive telecommunications services (PNETS) under the TO.

*Licensing of mobile TV services*

42. In this section we will focus on the licensing arrangements for mobile TV services. As noted above, there are two aspects to the licensing arrangements, viz. network carriage and programme services.

(a) Carrier licence

43. The operator of the network for transmitting mobile TV via the assigned frequency will require a mobile carrier licence under the TO. A mobile carrier licence is defined in section 2 of the Telecommunications (Carrier Licences) Regulation as “a carrier licence issued for communications between (a) moving locations; or (b) fixed locations and moving locations, but does not include a space station carrier licence”. Existing 2G and 3G mobile network operators are mobile carrier licensees. According to the Telecommunications (Carrier Licences) Regulation, the validity period of mobile carrier licences for mobile TV services shall be 15 years.

44. The TA is currently conducting a consultation on the relevant issues pertaining to fixed-mobile convergence<sup>15</sup>. One of the proposals is to create a “unified carrier licence” (UCL). If the new UCL regime is put in place when the spectrum is to be assigned, the issue or renewal of mobile carrier licences will be ceased and the licence to be granted for using spectrum in the relevant frequency bands will be the new UCL. On the other hand, if the UCL regime is not in place, the existing regulatory framework applies and the new licensee will be granted with a mobile carrier licence. Should UCL phase in afterwards, all the mobile carrier licensees will be invited to consider migrating to the new licensing regime as and when necessary.

(b) Application of the Broadcasting Ordinance

45. Under the BO, “television programme service” is defined<sup>16</sup> as “the provision of a service that includes television programmes for transmission by telecommunications –

- (i) That are readily accessible to, or made available to, the general public in or outside Hong Kong; or

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<sup>15</sup> TA Statement, “Deregulation for Fixed-Mobile Convergence”, 14 July 2006.

<sup>16</sup> Section 2, Cap. 562

- (ii) To persons, in 2 or more specified premises, simultaneously or on demand, whether on a point-to-point or a point-to-multipoint basis, or any combination thereof, having equipment appropriate for receiving that service.”

46. A television programme service is licensable under the BO if it falls within the four statutory categories of “broadcasting services”<sup>17</sup>, viz. –

- Domestic free television programme service
- Domestic pay television programme service
- Non-domestic television programme service
- Other licensable television programme service

47. With the exception of “non-domestic television programme service”, the other three types of broadcasting services as defined in the BO all refer specifically to “for reception by an audience of specified premises” where “specified premises” means domestic households and hotel rooms<sup>18</sup>. According to the mode of mobile TV services available or on trial overseas, the audience of mobile TV is not based on, or identifiable with, any “specified premises” within the meaning of the BO. Mobile TV is therefore neither intended nor available for reception of audience of specified premises. It follows that mobile TV is not a licensable service under the BO.

48. Non-domestic television programme service is one, which, in the opinion of the Broadcasting Authority, does not primarily target Hong Kong in terms of its coverage, sources of advertising and subscription revenues, language, and the degree of active marketing in Hong Kong. At present, licensed non-domestic television programme services are primarily satellite television services uplinked from Hong Kong and targeting the regional market. There may be circumstances where the BA considers a mobile TV service not primarily targeting Hong Kong and therefore is a licensable non-domestic television programme service under the BO. But such case will be unlikely.

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<sup>17</sup> Section 2, Cap 562

<sup>18</sup> Ibid

(c) Should mobile TV be licensed under the Broadcasting Ordinance?

*International experience*

49. Many jurisdictions are still formulating regulatory response to mobile TV:

- The Canadian regulatory authority proposes to exempt it from television licensing regime.
- South Korea has created a new category of licence in their broadcasting legislation specifically for mobile multimedia services.
- The EU's policy is to facilitate the rollout of mobile TV services but whether and how it will be regulated as a content service is under review. Currently, mobile content has been a matter for individual member states to regulate. In Italy and France, mobile TV is subject to the same rules applicable to digital terrestrial TV. Germany has adopted a co-regulatory framework for protection of minors in digital media (including mobile TV). In the UK, mobile operators have developed a self-regulatory code of practice for commercial mobile picture-based content, which include strategies to deal with concerns over minors accessing unsuitable content such as content rating, filtering and reporting procedures.
- In the US, mobile TV is basically an information service provided on mobile network. The regulator has requested the industry to discourage children from accessing adult content via mobile devices through public education, developing self-regulatory code of practice and providing restricted access system.
- Australian Government proposes to develop an adapted model to regulate content delivered to mobile devices following its existing classification scheme for films and literature, where classifiable content should be subject to restricted access. However, if a TV channel subject to the broadcasting regulation is made available to mobile devices, the broadcasting regulatory regime, including the necessary licensing requirements and access restrictions, etc, should apply to such mobile TV channels.
- Singapore operators have also developed self-regulatory code of conduct, similar to the UK.

*Rationale for the current licensing regime*

50. The existing licensing regime aims at regulating television services intended for reception within specified premises, i.e., indoor such as homes and hotel rooms. The traditional television services are readily accessible by families and large number of the public, including children. It is important to ensure through the licensing system that such services are of acceptable standard suitable for viewing by the general public. Whether mobile TV should be brought under the licensing regime would to a large extent depend on whether this consideration applies to mobile TV.

51. The arguments for not licensing mobile TV under the BO are:

- We should use a light-handed approach to remove regulatory burden that may stifle the growth and development of a new burgeoning service.
- At this stage, it is unlikely that mobile TV will emerge as a substitute for traditional television services and attain similar reach of audience. It is primarily intended for reception outdoor on the move and the content is designed for small display devices distinguishes it from traditional television services. In fact, 3G operators have been providing real time video streaming and even point-to-multipoint video services for reception by mobile phones already.
- The general perception is that mobile TV services do not have the look and the feel of traditional TV services and therefore not generally regarded as a TV broadcasting service.
- Bringing mobile TV into a licensing regime will require amendments to the BO, the formulation of licensing conditions and codes of practice under the amending legislation appropriate to the mobile TV services and the processing of licence applications. The whole process is likely to be protracted given the need for public debate, legislative scrutiny and consensus building on all the relevant issues. These uncertainties will present business risks that are likely to discourage investment and timely deployment of mature and commercially viable technologies in Hong Kong and availability of new services to consumers.
- Even if the current licensing regime remains intact pro temporal, the content of mobile TV services will still be subject to regulation by other laws of Hong Kong, notably the Control of Obscene and Indecent

Articles Ordinance (Cap. 390). Operators may be required to draw up industry code of practice for voluntary compliance. The code may require operators to provide access control to restrict access to adult contents from people aged 18 or above only. The code should also prescribe general principles of good practice in providing content.

- Should we license the new point-to-multipoint mobile TV services, we will also need to consider whether or not to license the existing mobile TV services in the form of point-to-point video-on-demand or video streaming provided on the 2.5G or 3G mobile telecommunications platform. If we only license the new but not the existing mobile TV services, this would bring regulatory asymmetry and is technology-specific.

52. The arguments for licensing are as follows:

- With rapid technological advancement, mobile TV may evolve into a pervasive mass medium that warrants some form of licensing control.
- The public may expect the Government to play a more active role to regulate the service to ensure its contents meet the basic requirements of factual accuracy, and decency for protection of children etc.
- Mobile TV appears to be one form of digital broadcasting services and there should not be any regulatory asymmetry as what distinguish mobile TV services from traditional TV services is arguably not fundamental.

We invite comments on whether mobile TV programme services should be licensed under the Broadcasting Ordinance and regulated accordingly through appropriate licensing conditions and codes of practice by the relevant authorities, and if so, how this should be achieved vis-à-vis the current licensing framework.

## **I. WAY FORWARD**

53. We invite interested parties to comment on our proposals set out in this consultation document. To gauge the level of commercial interest in launching the various digital broadcasting services in question, we intend to separately invite expression of interest from bodies and organizations in bidding for the relevant spectrum. Once comments on this consultation and responses to the expression of interest exercise are to hand, we will work out further details and proposals for a draft implementation framework for a second round of public consultation.

Communications and Technology Branch  
Commerce, Industry and Technology Bureau  
26 January 2007

## Mobile TV Development in Various Jurisdictions

### (a) Already Launched Commercially

Jurisdictions	Standard adopted	Spectrum	Operators	Services offered	Launch date	Remarks
Finland	DVB-H	UHF Band	SBS Finland and Digita	TV and radio broadcasts, games and interactive services	Jan-2007	Initially covering over 25% of people living in Finland and expecting coverage extends to 40% by Dec-2007
Italy	DVB-H	UHF Band	3 Italia and Reti Radiotelevisive Digitali	9-20 TV channels	Jun-2006	Claim to be the world's first commercial mobile TV on DVB-H technologies
Japan	S-DMB	S-band (2630 – 2655 MHz)	MBCO (Mobile Broadcasting Corporation) – a company established by Toshiba, SK Telecom, Sharp, Toyota etc)	- 7 (+ 2 premium) video channels, - 37 audio channels, - 50 data titles	Oct-2004 (with full national coverage)	Service named as 'MobaHO!'
	ISDB-T	In-band of DTT broadcasting (one out of 12 segments)	NTT DoCoMo, KDDI and local TV broadcasters in Japan	Simulcast of local DTT	Commercial Launch in Apr-2006	Known as 'One-Seg service'
South Korea	T-DMB	- Band III - L-Band	Six service providers in South Korea, i.e. - KBS, - MBC, - SBS, - YTN DMB, - U1 Media, - Hanguok DMB	A total of - - 7 TV channels - 13 radio channels - 7 data channels by the six broadcasters	Dec-2005 (in Seoul and its metropolitan areas)  2007 (in other areas)	Promoted by Samsung and LG
	S-DMB	S-band (2630 – 2655 MHz)	TU-Media Corp. (subsidiary of SK Telecom)	- 11 video channels, - 25 audio channels, - 3 data channels	May-2005	

Jurisdictions	Standard adopted	Spectrum	Operators	Services offered	Launch date	Remarks
UK	DAB-IP	L-Band (using existing DAB platform)	BT Movio partnered with Virgin Mobile (strategic partner with Microsoft)	- 5 TV channels - 30-50 DAB radio channels (free) - 7 days TV/Radio Guide (free) - Interactivity (red button)	Oct-2006	Pilot trial for 6 months (Jun-Dec 2005) with 1000 users in London

(b) Trial Run in Progress

Jurisdictions	Standard adopted	Spectrum	Operators	Services offered	Trial date	Expected Commercial Launch
Australia	DVB-H	UHF Band	Broadcast Australia Group and Telstra	16 TV channels	Jul-2005 (in Sydney)	-
China (Mainland)	CMMB	S-Band	China Mobile, China Unicom and CCTV jointly carry out the test.	Information not yet available	mid-2007 (tentative)	2008 (Satellite scheduled to launch in May-2008)
	T-DMB	Band III and L Band	BJ Jolon Digital Media Broadcasting, GD Mobile Television Media, Shanghai Oriental Pearl	TV, radio and data services	Nov-2006 (in Beijing,)  May-2006 (in Guangzhou and Shanghai)	-
France	DVB-H	UHF Band	TDF and TPS partnered with mobile operators Orange, SFR, Bouygues Telecom	- 14 TV channels - 13 radio services	Sep-2005 – Jun-2006 (in Paris)	Expected commercial launch in 2007 and Government suggested national coverage in 2008
			Canal+ partnered with Towercast (operator of broadcast infrastructure) and SFR (mobile operator)	- 13 TV channels - 4 radio stations		

Jurisdictions	Standard adopted	Spectrum	Operators	Services offered	Trial date	Expected Commercial Launch
France (Con't)	DVB-SH (Satellite DVB-H)	S-Band	Alcatel leads a project called <i>TVMSL</i> financed by French governmental agency <i>Agence de l'innovation industrielle</i>	A project to create a standard of hybrid terrestrial and satellite mobile TV based on DVB-H technologies, targeting delivering mobile TV service to whole Europe.	Satellite to be launched in 2008	-
Germany	DVB-H	UHF Band	E-Plus, O2, T-Mobile and Vodafone D2	- 14 TV programmes - 6 radio programmes - ESG - SPP (Service Purchase Protection)	Jun-2006 (in Berlin, Hamburg, Hanover and Munich)	Regional media authorities committed to working towards a rapid market introduction of mobile TV.
	T-DMB	Band III L-Band	A consortium of operators	- 5 TV channels - 3 radio channels	Jun-2006 (World Cup) (in Munich)	-
Hong Kong	DVB-H	UHF Band	PCCW and Motorola	10-20 linear TV channels / video programming	Sep-2006 (last for 6 months)	-
Singapore	DVB-H	UHF Band	Innoxius Technologies (research & system integration company with focus on wireless applications)	News and others	Jun-2006	-
Sweden	MBMS	Existing UMTS WCDMA (3G)/HSDPA (3.5G) cellular network	Ericsson	Information not available	Apr-2006	Second half of 2007
UK	DVB-H	UHF Band	O2 / Arqiva	16 TV channels	Sep-2005 – Mar-2006 (in Oxford)	UHF spectrum required by DVB-H may only be available after analogue switch-off after 2012

<b>Jurisdictions</b>	<b>Standard adopted</b>	<b>Spectrum</b>	<b>Operators</b>	<b>Services offered</b>	<b>Trial date</b>	<b>Expected Commercial Launch</b>
	MediaFLO	UHF Band (at 700MHz)	BSkyB	11 TV channels	Oct-2006 – Dec-2006 (in Cambridge)	-
USA	DVB-H	L-Band	Modeo and RRD	Package of live video and audio channels and podcast content	2005 (in Pittsburgh) 2006 (in New York City)	-
		UHF Band	Hiwire (a division of Aloha Partners) and T-Mobile	Information not yet available	Dec-2006 (in Las Vegas)	
	MediaFLO	UHF Band (at 700MHz)	Verizon Wireless	Information not available	2006	-