

Second Consultation on Digital Terrestrial Broadcasting in Hong Kong

With comments appended by NTL

Preface to comments

NTL were formally the engineering arm of the Government Regulator (The Independent Broadcasting Authority – IBA) in the UK. Whilst benefiting from a long history as a regulator NTL has become a leading light in the roll out of digital services worldwide. As one of the largest infrastructure owners, NTL has a unique insight into the real world issues surrounding the move to digital services. NTL has rolled out digital platforms in the UK, Singapore and Australia for some of the most exacting and competitive broadcasters in the world.

The comments appended herein are derived, not from theory but from factual, on the ground roll out and operations of services. Digital Services are now well established in the UK, and whilst every territory is unique in some way, a great deal of 're-inventing the wheel' is occurring elsewhere in the world quite unnecessarily. This re-invention or duplication of work is severely impacting the pace at which digital services are being implemented.

Hong Kong, like many other territories, is ideally placed to 'leap frog' the developments in UK, Singapore and Australia by learning from those experiences and adopting the most successful elements. This, undoubtedly, includes the adoption of a system of 3rd party infrastructure ownership and management. In the digital world Multiplexes and transmission have no place inside the broadcaster. To do so pre-supposes that the broadcaster can commercially support an entire multiplex and network. History has shown that this is most unlikely to be the case, and a regime that allows an element of 'churn' amongst the service providers is essential. The only way to achieve this is by creating a new business sector in infrastructure ownership and management.

**Communications and Technology Branch
Commerce, Industry and Technology Bureau
Hong Kong Special Administrative Region Government
5 December 2003**

www.info.gov.hk/citb/ctb

FOREWORD

In December 2000, the Government published a consultation paper on digital terrestrial broadcasting in Hong Kong. We subsequently received 23 submissions. Both the consultation paper and the submissions can be found at the website of the Communications and Technology Branch at www.info.gov.hk/citb/ctb.

This document highlights the Government's thinking on the proposed way forward for introducing digital terrestrial broadcasting into Hong Kong. It is based on our analysis of the submissions responding to the earlier consultation in 2000, the outcome of our coordination with Mainland authorities regarding the frequency plan for digital terrestrial television broadcasting in Hong Kong, and our evaluation of overseas developments in digital broadcasting.

We now invite public comments on the proposals set out in this document. Such comments should be sent to the Communications and Technology Branch by 5 March 2004 by any of the following means:

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Introduction

1. In December 2000, the Government published a consultation paper on digital terrestrial broadcasting in Hong Kong. The paper set out the Government's recommendations on the relevant issues relating to the implementation of digital terrestrial television (DTT) broadcasting and the way forward for introducing digital audio broadcasting into Hong Kong. In the submissions responding to this consultation (the first consultation), there was general support for the Government's initiative to introduce DTT broadcasting into Hong Kong as soon as practicable and to introduce digital audio broadcasting only when it is commercially viable.

[NTL Comments: There have been significant changes in the environment and costs since December 2000 which may result in different conclusions. More territories have decided upon their DTT standards and consumer equipment pricing has reduced significantly. Additionally, rather than a 'multiplex per broadcaster' approach, the advent of 3rd party infrastructure management/ownership has led to a greater focus on single, commercially unrelated services operating on managed infrastructure, allowing for a scalable market entry by the service providers]

2. One of the main concerns arising from the first consultation is the issue of technical standard for DTT broadcasting. Not long after the publication of the consultation paper, the Mainland announced that it would develop its own DTT technical standard. Some submissions, notably those from Asia Television Limited (ATV) and Television Broadcasts Limited (TVB), strongly suggested that the Government should defer the decision on the technical standard to be adopted in Hong Kong for DTT broadcasting until the Mainland had promulgated its own standard. The two broadcasters believed that if the Mainland and Hong Kong shared the same technical standard, multimedia applications developed in Hong Kong would have the potential to capture a larger market, thereby stimulating investment in this area. Besides, consumer products based on the Mainland standard was likely to be more affordable due to mass production.

Background to the present consultation

3. In the light of this representation, the Government agreed to conduct a second round consultation at a later stage, taking into account the development on the Mainland. Three years have passed since then. To date, the timetable for the promulgation of technical standard on the Mainland remains uncertain. On the other hand, notwithstanding the initial lacklustre rollout of DTT broadcasting in other parts of the world, notably in Europe, the situation has improved with the availability of more affordable consumer products and digital content, particularly high-definition television (HDTV) programmes. This more positive outlook of DTT broadcasting and the need to maintain Hong Kong's lead and competitiveness in the area of broadcasting have reinforced the case for paving a solid way for introducing DTT broadcasting into Hong Kong. The pertinent issues that are essential to providing DTT broadcasting would need to be addressed sooner, rather than later. Indeed, in response to the first consultation, there was support for the adoption of the European DVB-T technical standard for DTT broadcasting, as well as the concern that waiting until the situation on the development of the Mainland's technical standard was clear would delay the rollout of DTT broadcasting in Hong Kong.

[NTL Comments: Far from lackluster, DTT in Europe is now doing well driven by reduced equipment costs and the benefit of experience on which models work best. This will benefit HK in a successful roll out. The concerns that HK must wait for mainland China to benefit from equipment cost reductions has become a very secondary issue. The DVB-T boxes are increasingly being manufactured in these low cost environments and in quantities where the economies of scale are already significantly bringing costs down. Any other concerns to do with the free flow of content between China and HK are also unfounded since the transmission standards need have no impact on the standards used to store and distribute content.]

4. This second consultation paper thus seeks to set out a total framework for the introduction of DTT broadcasting into Hong Kong. It represents our latest views and in this process we have taken into account the views that we received during the first consultation, the relevant market and technical developments in the last three years, and the experience of other economies.

Hong Kong's experience

5. Digital television can be transmitted through different means, including terrestrial radio communications, satellite, broadband network and cable. Although we have yet to commence digital terrestrial television broadcasting, digital television broadcast is already available to viewers in Hong Kong via cable, satellite and broadband network (see Box). The Hong Kong Cable Television Limited commenced its migration to digital transmission in January 2002. The relevant licensing conditions require it to complete digitization by the end of May 2005. As of now, out of its 640,000 subscribers, about 50% are receiving digital services. Yes Television (Hong Kong) Limited and TV Plus (HK) Corp Limited launched digital pay television services via broadband network and satellite, respectively, in February 2002. PCCW VOD Limited launched digital broadband pay television service as recently as in September 2003. Galaxy Satellite Broadcasting Limited, another pay television operator, will launch its digital satellite pay television services soon.

[NTL Comments: None of these are 'mobile' and few (if any) carry Value Added services or return paths. DTT offers some unique benefits, including mobility as well as reception on existing terrestrial antennas and remains the best and most cost effective platform for free to air, advertisement supported programming.]

6. The development of digital television broadcasting in Hong Kong is similar to that of other economies, including the Mainland, where the introduction of digital television has been driven to a large extent by pay services via cable or satellite.

[NTL Comments: Although pay services can provide one model, it is important to remember that TV first began, and for many operators remains, a free to air service. This model has created some of the world's largest TV broadcasters and should continue to be viewed as an option, or element of the mix of options, for digital TV going forward.]

Benefits of DTT broadcasting

7. The benefits of DTT broadcasting are clear. Signals transmitted as discrete bits of information improve picture and sound quality and reduce problems such as ghosting and interference that affect viewers in a hilly environment or areas with high-rise buildings. In comparison with analogue broadcasting, digital broadcasting makes more efficient use of the available spectrum. The same bandwidth for transmitting one analogue programme channels can accommodate at least four digital standard definition television (SDTV) programme channels. Furthermore, digital television broadcasting will bring benefits to viewers, including the possible increase in the number of television programme channels, introduction of HDTV programmes, television reception on the move and new interactive multimedia applications.

[NTL Comments: Probably 6 SDTV channels is fairer. Furthermore multipathing (which is an inevitability in the HK environment, can help the digital signal and may be part of the design of a network in a place such as HK.)

Framework for the introduction of DTT broadcasting

8. The introduction of DTT broadcasting and the transition from analogue to digital broadcasting involve the following major regulatory considerations:

- (a) frequency planning and coordination;
- (b) adoption of technical standard;
- (c) simulcast and transition to DTT broadcasting;
- (d) allocation and licensing of multiplexes; and
- (e) analogue switch-off.

[NTL Comments: Revenue from spectrum release is a key area here, and can provide justification for significant government intervention in priming the market and the introduction of the platform. Whilst the regulator in HK is not a revenue generating entity per se, this additional benefit should not be ignored in the new 'digital' environment.]

9. A major issue in this context is the timetable to rollout DTT broadcasting in Hong Kong. Given the background set out in paragraph 3 above, *the Government's clear intention is to see the introduction of DTT broadcasting as soon as possible, and within 2006 at the latest*. We feel that in practical terms such a clear indication will be helpful to put the regulatory issues in perspective, particularly in relation to simulcast arrangements, the timetable for the allocation and licensing of multiplexes and the planning and introduction of new services. In this context the Government has already included as a licensing condition the power to require ATV and TVB to start simulcast by giving an 18-month advance notice.

[NTL Comments: Shutting down analogue is of a much greater concern. If analogue turn off were defined this notice period would not be required (thus allowing ATV and

TVB to be more market 'reactive') if such notice were made unnecessary by the presence of a 3rd party infrastructure/multiplex entity.]

Frequency planning and coordination

10. We estimated in the first consultation that there would be six multiplexes available for DTT broadcasting, three of which would be based on single frequency network (SFN) configuration and three on multiple frequency network (MFN) configuration.

[NTL Comments: It is important to understand the commercial driver behind this decision since it will impact the extent of localised programming that is possible]

11. Since the publication of the last consultation paper, the Government has completed frequency coordination with the Mainland authorities regarding the frequency plan for DTT broadcasting in Hong Kong. Our objective is to enable operators to design a network with territory-wide coverage but without interference to the transmission of the existing and planned telecommunications and broadcasting services in Hong Kong and neighbouring areas. According to the agreed frequency plan, it is now confirmed that there are five multiplexes available for the implementation of DTT broadcasting in Hong Kong, four of which are SFN multiplexes and the remaining one MFN. A summary of the technical details of the frequency plan is available on the website of the Office of the Telecommunications Authority at www.ofta.gov.hk.

Technical standard

12. In the first consultation paper, we took into account five criteria in selecting the DTT technical standard for Hong Kong. Briefly these criteria are:

- (a) the selected standard should facilitate the provision of sufficient channel transmission capacity (e.g. able to support SFN transmission) to meet new demand for broadcasting services during and after the simulcast period;
- (b) the selected standard should support mobile reception;

[NTL Comments: We strongly support this since it is one of the key differentiators for digital]

- (c) the channel bandwidth adopted by the selected standard should be compatible with the 8 MHz channel bandwidth that is currently used in Hong Kong for terrestrial television broadcasting;
- (d) the selected standard should preferably be widely adopted internationally. There should be a full range of consumer products such as set-top boxes and integrated television sets based on the selected standard in the market at competitive prices; and

- (e) it would be advantageous for the selected standard to be interoperable with other broadcasting services delivered by different transmission platforms such as satellite or cable. The commonality in the system design of the relevant broadcasting equipment and TV receivers may lead to cost savings in both network rollout and network operation.

13. Three technical standards were then available at the time of the first consultation. They were the American ATSC-T standard, the European DVB-T standard and the Japanese ISDB-T standard. Based on the above criteria, the Government recommended DVB-T as the DTT standard for Hong Kong. DVB-T is also the most suitable for the Hong Kong environment based on the findings of technical field trials. It is a sophisticated technology that supports both SFN and MFN configurations, multimedia services, the Multimedia Home Platform and robust mobile reception. Moreover, it is a proven technology already adopted by many other economies with a wide range of compliant consumer products available in the market. Today these considerations remain valid.

14. However, we would not wish to rule out the possibility that any new standard that eventually emerges from the Mainland's own research and development may have better technical features than DVB-T. Also it is likely that consumer products based on this Mainland standard, manufactured on the Mainland, and targeted the huge Mainland consumer market could be more affordable than those based on DVB-T. Alignment with the Mainland DTT standard may also facilitate the access of Hong Kong programmes and services on a compatible technical platform to the Mainland market, as ATV and TVB argued. There are therefore merits to defer the decision on the technical standard to be adopted in Hong Kong. However, this will mean further delay in the launch of DTT broadcasting in Hong Kong.

[NTL Comments: There is an argument here that says that, due to a cost base significantly lower than Hong Kong's, the Mainland will, in fact, end up doing all software AND hardware production. Our opinion is that this view, as stated above, is misguided from a commercial perspective. Maintaining a focus on content distribution across Asia as a whole would be safer (as HK does now).]

15. We now propose a "market-led" approach as the way forward. Under this approach, there is no officially prescribed technical standard but DVB-T will remain the one recommended by the Government in the light of the technical and market information available so far. *A multiplex operator would have the option of adopting DVB-T or proposing another technical standard if it can be proven to the satisfaction of the Telecommunications Authority that it meets the five criteria set out in paragraph 12 above and that in the case of ATV and TVB, the adoption of the proposed standard would not cause delay in starting simulcast in 2006 and achieving territory-wide network coverage in 2008.* The same approach applies to the adoption of sound system.

[NTL Comments: For clarity reserve 2 channels (multiplexes) as 'open' standards but at least plant the flag with a single standard (DVB-T?) to avoid market confusion. The danger of being perceived as indecisive is sure to limit and slow down the commercial sector's willingness to invest. If cost and risk are the concern why would one risk

instilling uncertainty into the broadcaster's mind (as well as the infrastructure investors) by being unclear. People putting money at risk demand clarity.]

16. Arguably the disadvantage of this approach is the possibility that different multiplex operators may adopt different, and possibly Multimedia Home Platform (MHP) is a software architecture that defines a generic interface between interactive digital applications and the terminals, such as set-top boxes, integrated digital TV sets and personal computers, on which those applications execute. In other words, MHP is an enabling software in the user-end terminals that supports Internet browsing, television broadcast and interactive services such as on-line shopping. Economies where the DVB-T standard has been adopted or DVB-T based digital television services have been launched include the European Union, New Zealand, Australia, Poland, Israel, Baltic States, the Czech Republic, Singapore and Taiwan. About 17 manufacturers are producing DVB-T compliant set-top boxes and integrated digital television sets. incompatible, DTT standards. This may in turn cause inconvenience to viewers, as they may have to buy different set-top boxes for receiving all DTT services. However, amidst the uncertainty over the technical standard to be adopted on the Mainland and the resulting lack of a policy decision in Hong Kong in the past three years over this key issue, the proposed “market-led” approach is an enabling move to minimize the uncertainty as far as the regulatory environment in Hong Kong is concerned. This approach, together with the timetable indicated in paragraph 9 above, encourages existing and prospective new broadcasters to focus on the planning of DTT broadcasting again, while allowing a reasonable period for the existing terrestrial broadcasters to wait for the Mainland standard. Practically it is not totally inconceivable that the existing and prospective new broadcasters would converge on this important matter of technical standard in the light of the market conditions then prevailing or being anticipated.

[NTL Comments: We wholly disagree that “*the proposed “market-led” approach is an enabling move*”. There must be clear direction on this from regulators. A market led approach is fine where a platform is 100% controlled by a single operator as a proprietary system, but DTT does not follow this model. A market led approach will lead to a situation where competing objectives, philosophies and approaches will stifle and hamper the roll out through the resulting indecision.]

17. On the technical side, multiplex operators may have the incentive to make access to all digital terrestrial services hassle-free by enabling reception of all services by one single set-top box. As such, they may coordinate their network rollout based on the same standard or interoperable standards. As indicated in the first consultation, the Government will consult the industry separately on the regulation of set-top boxes and integrated digital TV sets and on measures to ensure interoperability and accessibility on a non-discriminatory basis to safeguard consumer interests.

[NTL Comments: If HK adopts a system whereby the infrastructure and Multiplex operations are handled by a separate central entity (private or public) the issue of interoperability becomes theirs, in development with their customers (the broadcasters).]

Simulcast and transitional arrangements

18. The transition from analogue to digital broadcast needs careful handling as it affects frequency allocation, simulcast arrangements, the licensing framework applicable to existing and new operators, and also the planning for the rollout of new digital services.

[NTL Comments: This is something where lessons can be learnt from other implementations, as unique as HK may be in some areas, it needs to avoid re-inventing the wheel in others. The rollout of DTV will incur significant capital investment. The phasing of the investment can be aligned to coverage and channel expansion in line with commercial drivers. It is possible to plan the network to launch with say two multiplexes to all areas or say 5 multiplexes to key markets. On the basis that broadcasters, working with a common transmission entity and commercial goal, share infrastructure significant economies of scale can be achieved.]

19. The transitional arrangements proposed in the first consultation were based on the availability of three SFN and three MFN multiplexes for Hong Kong (see paragraph 10 above). Instead of granting each existing terrestrial television broadcaster a multiplex for simulcast, we proposed to reserve a “guaranteed slot” (50% of the capacity of a multiplex) on two different MFN multiplexes for the simulcast of the existing free-to-air analogue television channels operated respectively by ATV and TVB. On the other hand, ATV and TVB would need to go through the application procedure to secure the whole multiplexes (the remaining 50% outside the “guaranteed slot”) for rolling out new digital services.

20. In response to the first consultation, ATV and TVB pointed out that as half of the capacity of the designated MFN multiplexes would be used for simulcast, the remaining capacity would not be sufficient for rolling out new services such as HDTV programmes, which require the capacity of an entire multiplex. There would thus be no incentive for any operators to run these multiplexes.

[NTL Comments: HDTV is demanding in terms of multiplex capacity compared to SDTV. The transmission system can accommodate HDTV and SDTV the impact will be on content generation and processing and receiver design. A clear decision will be needed if HDTV is a requirement to ensure that STB strategy is correct. The only markets where HDTV programming has been used in simultaneous transmissions have attracted the viewers expected and have either failed or are being supported on an un-commercial basis. HDTV is a technology for the future but attempting to drive today’s DTT implementations on it will result in a far more costly, problematic and slow rollout. Decisions on simulcasting channels must be made carefully and make no assumptions about the positions of incumbent operators. In order to create an attractive platform, simulcasting of only the most popular channels is required, even if only for the transitional period where spectrum remains at a premium.]

21. As can be seen from paragraph 11 above, there are four SFN and one MFN multiplexes available for Hong Kong according to the latest frequency plan. Given that our objective is to guarantee multiplex capacity for ATV and TVB to facilitate their transition to digital broadcasting and that the operation of an MFN multiplex requires close coordination between the existing terrestrial broadcasters on re-tuning some existing analogue frequency channels, *we propose that the only MFN multiplex available*

under the latest frequency plan be assigned to ATV and TVB for simulcasting the existing analogue programme channels in both analogue and digital forms. ATV and TVB will share the capacity of this multiplex equally and may use any spare capacity to roll out additional services. [NTL Comments: A very good idea.]

22. On this basis, we propose that the period of validity of this direct assignment of the MFN multiplex should tally with that of their existing carrier licences (from 1 December 2003 to 30 November 2018). The direct assignment should be subject to the following conditions:

[NTL Comments: Or until analogue switch off, whichever is the earlier. By 2018 (or switch off) the TV market in HK will be unrecognizable from what it is now, with 4 'other' SFN multiplexes operating by then (possibly 24 channels @ SD). The MFN multiplexes used for simulcast should be released immediately for HDTV or other use by the market and not retained by TVB/ATV at their leisure. This may stunt growth of the last 20% of the DTT capacity. The penetration of set top boxes will be determined by content, coverage and availability. If the DTV platform offers little in the way of compelling content it is unlikely that a Market Led approach will achieve ATO in 2018. A hybrid approach may be more appropriate to ensure few viewers will be without service when the analogue services are terminated.]

- (a) ATV and TVB must start simulcast in 2006 and reach territory-wide digital coverage in 2008 in accordance with the specific dates to be appointed by the Secretary for Commerce, Industry and Technology;
- (b) ATV and TVB must share facilities, including equipment rooms and antenna mounting towers at hilltop sites, with new network operator(s) if directed by the Telecommunications Authority; and

[NTL Comments: This is where HK should be working to get an independent infrastructure provider in place. Here there is apparently a firm deadline to work to. [0]This is critical to the success of the platform, partly to ensure that the inherent benefits of digital are fully realized but also, assuming such shared facilities were operated on an open access, level field basis, to new entrants]

- (c) ATV and TVB must each or jointly submit a plan on the promotion of consumer take-up of DTT broadcasting. This may include regular publicity campaigns to raise public awareness until analogue switch-off.

23. The proposed dates of simulcast and full coverage would give ATV and TVB sufficient lead time to implement digital broadcasting. The detailed network rollout timetable will be incorporated into their multiplex licences which will be carrier licences as explained in the following paragraph.

Multiplex licensing framework

24. In the first consultation paper, we recommended that multiplex operators, programme service providers and additional services providers would be licensed

separately. Multiplex licences and additional services licences would be carrier licences and Public Non-exclusive Telecommunications Service (PNETS), respectively, under the Telecommunications Ordinance (Cap. 106). A multiplex operator might reserve up to 25% of the capacity of a multiplex for additional services. There would be no mandatory requirements for HDTV programmes and mobile reception at the initial stage of implementation of DTT broadcasting. Programme service providers would continue to be licensed under the Broadcasting Ordinance (Cap. 562). *We intend to adopt these proposals given the clear support for them we received in the first consultation.*

[NTL Comments: 'Gifted' Multiplexes are not preferable. If a separate Multiplex operator were established, ATV and TVB should have a 'first call' deal, but if they elect not to use them, they should become available for others, otherwise 'selling' the multiplex may be difficult for the operator. A sound framework must additionally ensure there is space and ease of access for new entrants, an inevitability of the proliferation of services engendered by DTT is an element of 'churn' of services, especially initially.]

25. As regards the allocation and licensing of multiplexes, we proposed in the first consultation that a multiplex operator should not operate more than two multiplexes and a television programme service provider should not occupy multiplex capacity of more than one multiplex (excluding the capacity for simulcast by the existing terrestrial television broadcasters). We also suggested that only domestic television programme services should be carried on the multiplexes.

[NTL Comments: Should the 'must carry' arrangement be with the Multiplex operator rather than the broadcasters? This would seem like very good mechanism for restricting dominance of incumbents]

26. There were diverse views on the proposed restrictions on the number of multiplexes that a multiplex operator might operate and on the multiplex capacity that a television programme service provider might occupy. Some supported such restrictions on grounds of promoting competition, while some considered such arbitrary restrictions unnecessary, as market forces would establish how many operators the market could accommodate. Some respondents considered it unnecessary to restrict television programme services carried on multiplexes to domestic television programme services only.

[NTL Comments: The fewer restrictions the better for a 3rd party Multiplex operator.]

27. We have reviewed the issue of allocation of the four SFN multiplexes under the agreed frequency plan. We agree that the restrictions proposed in the first consultation paper may affect adversely a multiplex operator's ability to achieve economies of scale by operating more multiplexes and limit a television programme service provider's flexibility in rolling out enhanced services. We therefore propose to remove the restrictions contemplated in the first consultation paper. Instead, the licences for operating these multiplexes will be awarded through an open, competitive process. ATV and TVB may apply for further multiplexes, in addition to the MFN multiplexes directly assigned to them for simulcast, to roll out new services such as multi-channel broadcasting or HDTV programmes.

[NTL Comments: Be careful not to ignore the TX side of this. The TX and Multiplex award could be one award independent of, though open to bids from ATV and TVB.

Significant economies of scale will be achieved by sharing of infrastructure across multiplexes. It is not clear whether this is addressed here?]

28. This approach is consistent with what we put forward in the first consultation. It ensures smooth digital transition by guaranteeing the existing broadcasters adequate spectrum capacity to simulcast and at the same time allows both incumbents and new players the opportunity to operate the SFN multiplexes for new services based on the merits of their proposals in the competitive process. We are sensitive to the possible concerns from ATV and TVB about this arrangement. However, in our view, the alternative of allowing ATV and TVB to take up the SFN multiplexes on a priority basis, and allocating any remaining multiplexes through an open process will be undesirable. It may deny prospective new players market entry, discourage competition, deprive the public of alternatives based on merits of services and programmes, and not represent the best use of limited spectrum resources. On balance, we maintain the open application method as proposed in the first consultation, but grant ATV and TVB the MFN multiplex for simulcast as the way forward.

29. At this stage, we envisage a two-stage process in selecting licensees for the SFN multiplexes. Subject to the outcome of this consultation, we would invite expression of interest in the second half of 2004 to gauge market interest and receive broad proposals based on the Government's requirements. In the light of the responses received the Government may ask short-listed parties to submit detailed proposals for assessment with a view to issuing licences to the deserving applicants within the limitations of spectrum availability.

30. Details of the relevant criteria and processes will be announced in due course. At this stage we envisage the importance of the following broad criteria, which were generally supported in submissions to the first consultation:

- (a) rollout timetable and geographical coverage of DTT broadcasting;
- (b) business plan for promoting early consumer take-up of DTT broadcasting;
- (c) service profile on multiplexes, including the mix of television programme services and additional services, the availability of HDTV and/mobile reception and the timing of their availability where applicable; and
- (d) the impact on competition and efficient use of multiplex capacity.

[NTL Comments: Should add 'Feasibility of separately owned and managed infrastructure']

31. It is envisaged that the general conditions of a multiplex licence include the necessary requirements to provide carrier service to television programme service licensees and additional service licensees in a non-discriminatory way, to comply with relevant technical standards and to fulfill the commitments on network coverage, investment and service obligations as contained in the application documents.

32. In order to enrich the choice of viewers, we will allow all television programme services licensed under the Broadcasting Ordinance to be carried on the multiplexes.

Analogue Switch-off

33. The Government recommended in the first consultation that it would conduct a review within five years of the commencement of simulcast or when the penetration of DTT broadcast reaches 50% of all TV households, whichever is earlier, to decide whether, and if so, when analogue broadcast should be switched off. We intend to adopt this recommendation in the light of the public support received.

[NTL Comments: It is very important not to ignore the possible commercial benefits, through spectrum release, of analogue switch off, this may accelerate the process significantly]

Conclusion on the way forward for DTT

34. Our proposals above have set out a reasonable timetable for the rollout of DTT broadcasting. Through the proposals in the first and this second consultations, the Government has set out its views clearly on smooth digital transition. There would be opportunity for the existing terrestrial television broadcasters to provide enhanced services and for more competition. The transition from analogue broadcasting to DTT broadcasting would be a long process. The Government would coordinate among different parties during this process and plan a smooth analogue switch-off at a later stage. We look forward to close collaboration with the two existing terrestrial television broadcasters and new investors in the imminent future to bring DTT broadcasting and its enhanced services to the viewers of Hong Kong.

Digital audio (DA) broadcasting

35. The Government has made available L-Band frequencies for DA Broadcasting service in Hong Kong. While the DA Broadcasting technology can deliver better sound quality and enhanced services (e.g. teletext, data, graphics and low quality video), it appears that commercially viable models of DA broadcasting exploiting the full potential of the technology are not yet available. On the other hand, digital receivers are becoming more affordable. Low-end portable receivers costing about HK\$1,000 are available in the market. Variants of DA broadcasting technologies such as Digital Radio Mondiale or DRM are also emerging.

[NTL Comments: A common infrastructure designed for DTV will assist this argument and attract investment from the infrastructure company.]

36. We maintain our recommendation in the first consultation that the launch of DA broadcasting services should be market-led. The existing sound broadcasters should be allowed, under their respective licence conditions, to continue to make use of the AM/FM frequencies for analogue broadcast.

[NTL Comments: Some consideration of market seeding here may help implementation, promotion of DA in cars is a good example.]

37. Nevertheless, we consider that there should be no regulatory obstacles to the deployment of new technologies and entrepreneurial ventures to launch innovative services including digital transmission of specialised info-data to specified user groups (e.g. transmission of information to buses). We propose that parties interested in launching digital radio services may apply for the Telecommunications Authority's approval to roll out trial services. Also, since broadcasters in some overseas countries (e.g. the UK) use Band III frequencies for DA broadcasting, the Telecommunications Authority will consider, subject to spectrum availability, applications for using Band III frequencies for DA broadcasting.

38. In the first consultation, we took the opportunity to consult the public on the proposal to rationalize the regulatory regime for radio services by bringing it under the Broadcasting Ordinance. We received favourable responses in the submissions. Proposals in this respect will be included in the consultation paper on the review of the broadcasting regulatory regime to be published in 2004.

- END -