

Licensing Framework for Third Generation Mobile Services

Analysis of Comments Received, Preliminary Conclusions and Further Industry Consultation

3 October 2000

Part I - Introduction

1.1 On 21 March 2000, the Telecommunications Authority (TA) issued an industry consultation paper on the licensing framework for third generation (3G) mobile services (first consultation paper). The first consultation paper identified and discussed the following issues on the licensing of 3G mobile services and consulted the industry and interested parties on these issues, prior to finalization of the licensing framework for 3G mobile services in Hong Kong:

- Choice of technical standards
- Allocation of radio spectrum
- Treatment of new entrants
- Licensing options
- Operator selection arrangement
- Other regulatory issues

1.2 The deadline for submission of comments was 22 May 2000. The TA received 49 submissions, including 17 from individuals and academics, five from organizations representing different interests, three from political parties/Legislative Councillors and the rest from operators (existing or potential) or equipment manufacturers. The submissions received have been published on the web site of the Office of the Telecommunications Authority (OFTA) at <http://www.ofa.gov.hk>.

1.3 The TA has reviewed and analyzed the comments from the submissions, as well as further information on the latest development in the market and regulation overseas. In this consultation paper, the TA aims to present his analysis on the submissions. The TA has formed some preliminary views on certain issues, and would like to seek further comments on these views as well as some remaining issues. The TA intends to finalize the licensing framework for the 3G services and invite applications for licences around end 2000/early 2001.

1.4 It is evident from the submissions received that the more controversial issues in the consultation are the operator selection arrangements, the number of licences (which is inter-related with the width of spectrum assigned to each operator) and the treatment of new entrants in the licensing exercise. The remainder of this consultation paper is organised into four parts. Part II deals with the operator selection arrangements. Part III deals with the spectrum width assigned to each operator and number of licences. Part IV deals with the other regulatory issues. Part V deals with the way forward.

Part II – Operator Selection Arrangements

2.1 Proposal in First Consultation Paper and Views from Submissions

2.1.1 In paragraphs 4.7 to 4.13 of the first consultation paper, the TA put forward his views on two principal approaches for the selection of operators for 3G services, the “selection by merits” approach and “spectrum auctioning” approach. In the first consultation paper, the TA indicated his inclination to adopt the well-established “selection by merits” approach for the allocation of limited spectrum to 3G operators. This particular issue has received the most enthusiastic response in the submissions.

2.1.2 Apart from two operators (one incumbent and one other), the operators, equipment manufacturers and organisations representing their interest generally supported the “selection by merits” approach. A few submissions from individuals who are not operators or manufacturers also supported this approach. Many considered that the “selection by merits” approach, if adopted, should be made transparent. The principal views of those in support of the “selection by merits” approach are summarized below:

- spectrum auctioning would increase consumer prices because it would be inevitable that investors would have to seek sufficient revenue from customers to obtain a return on the investment in the spectrum right;
- spectrum auctioning would place an unnecessary financial burden on the operators, increase investment risk, and as more funds would have to be diverted to finance the spectrum cost, this would have a detrimental effect on the speedy roll-out of networks, new service

development and the quality of 3G services;

- Hong Kong would stand to gain more from a thriving telecommunications and information industry that would result from competitive prices of telecommunications networks;
- the auctioning approach would put more emphasis on the financial capability than the operational/technical capability of bidders, so well-capitalized corporations which could afford to pay the high premium for the spectrum would be favoured while those smaller companies with innovative ideas would be left out;
- irrational auction bidders might go bankrupt after winning the bids, and such a consequence could delay the launch of the 3G services, a setback the Hong Kong public cannot afford;
- successful bidders in the auction might bid for the 3G licences as a “financial asset” for trading in the market instead of developing and operating the 3G networks;
- auctioning would be unfair to 3G operators as the spectrum licences for existing mobile operators and wireless Fixed Telecommunications Network Services (FTNS) were awarded for free; and
- the “selection by merits” approach has worked well in Hong Kong.

2.1.3 One incumbent operator was strongly in support of the “spectrum auctioning” approach. It believed that using service pricing as a key criteria in the “selection by merits” proposal was inappropriate to the yet-to-be-defined 3G environment. In its view, this approach would create a significant potential to induce operators to trade inferior quality for lower pricing levels, while variations in pricing and quality of service in each bidder’s 3G business model would make pre-bid comparison unreliable and post-award performance monitoring unworkable.

2.1.4 Most of the submissions from individuals, academics and political parties/Legislative Councillors supported the “spectrum auctioning” approach. Their views include the following:

- spectrum price paid would be a “sunk cost” and would not affect consumer prices, which would be determined by market forces and what the consumers are prepared to pay for the services;

- an auctioning process is transparent, fair, objective and economically efficient;
- the revenue raised from auctioning could help finance the budget of the Government, reduce the tax burden on the community or provide benefits to the disadvantaged who are non-3G users;
- the general public should not subsidize 3G users or operators; and
- auction could save officials from damaging accusations of favouritism and cronyism in a selection process based on “merits”.

2.1.5 Some submissions suggested “hybrid” approaches aimed at capturing the benefits, while avoiding the disbenefits, of both approaches. One submission, while supporting selection based on the merits of applications, suggested that the operators should pay spectrum utilization fees. One submission proposed that the “monopoly rent” (excessive profit) earned by the 3G operators should be taxed. Another submission proposed the collection of royalties from licensees, rather than an upfront payment of cash.

2.2 Discussions

2.2.1 The TA has noted the arguments put forward in the submissions for and against the “selection by merits” and “spectrum auctioning” approaches. He is conscious that he has to adopt an approach which would achieve the following objectives:

- licences are awarded in a fair, transparent and objective manner;
- successful applicants will be able to build strong, sustainable businesses which will provide a competitive industry for the long term;
- adequate network investment will be made; and
- consumers will benefit from low prices for 3G services, fast rollout of networks and innovative 3G services.

2.2.2 In short, the TA wants to look for an approach that would result in the greatest economic benefit to the community as a whole. Taking into account all the views and comments received and the latest developments in the 3G market in other places, his considerations on the various possible options are summarized in the following paragraphs.

Selection by Merits

2.2.3 Often referred to as the “beauty contest” approach, the “selection by merits” method has been the way in which mobile phone licences have been awarded in Hong Kong to date.

2.2.4 The benefits of this approach are as follows:

- The TA can examine the business plans of applicants to ensure that they have the financial and technical capability and local market knowledge to roll out a network.
- The various innovative service offerings from each applicant can be assessed and those with plans most likely to benefit consumers are chosen.
- Operators can be required to take out performance bonds to ensure their implementation of the key features of their submissions.

2.2.5 On the other hand, this approach suffers from the following disadvantages:

- The “selection by merits” might result in the operators pocketing the “monopoly rent” from the operating right of the spectrum (meaning the excessive profit over and above that which justifies the risk of investment) instead of it being channelled back to the community through spectrum pricing or price reduction. Some successful operators might even sell the operating right to pocket the value of the spectrum without investing in or operating the services.
- The “selection by merits” approach tends to favour incumbent telecommunications operators. However, due to the convergence opportunities offered by 3G, new networks are of as much interest to content providers and applications suppliers as telecommunications operators. Network roll-out is no longer a specialist skill of telecommunications operators and can be subcontracted.
- Because 3G services and rollout requirements are so unknown as yet, attempts to choose between operators on the basis of their business plans may be highly subjective or even arbitrary. Promises or forecasts of services, even if they are contained within licence terms, may turn out to be meaningless.

- The subjectivity of the allocation process in the relatively unknown 3G market exacerbates the risk of litigation, which in turn can delay network rollout and prolong market uncertainty.

2.2.6 The TA has noted the above drawbacks of the “selection by merits” approach, particularly the fact that this approach has been perceived by some as being less transparent when compared with the auction methods. As this selection is based solely on the assessment of the merits of the business proposals submitted, it may arguably be more subjective than previous exercises the TA had conducted since the 3G business is still full of uncertainties. For this reason, the TA accepts the view that, in the context of licensing for 3G services, a pure “selection by merits” approach is unlikely to be acceptable to the public.

Cash Auction

2.2.7 The arguments for the cash auction are as follows:

- By requiring applicants to “put their money where their mouth is”, it theoretically allocates licences to those parties who have the best business case.
- It is highly objective, choosing between parties on the basis of who makes the highest bid rather than who promises the best network or services.
- It allows the market to decide subsequent service levels and the speed and extent of rollout.
- It provides revenue for the Government and taxpayers by requiring operators to pay a market price for a scarce asset.
- It is relatively quick and encourages immediate network rollout to recoup the significant upfront licence costs.

2.2.8 Cash auctions are, however, considered inappropriate by others. The arguments against an auction are as follows:

- The auction costs might be passed on to consumers. Although a number of economists consider auction costs to be “sunk costs” in a 3G network operation, another school of economists disagrees that all costs will be sunk. The latter considers that a high auction fee would

increase the upfront investment in a 3G network which would need to be recovered from sales of the service, particularly when there are few alternative products in competition with a 3G service.

- The auction costs might stifle investment in 3G networks. Theoretically, capital expenditure projections should drive the highest price bidders are willing to pay in an auction. However, if the capital expenditure estimated in the business case turns out subsequently to be higher than expected, and the licensee finds itself capital constrained, network investment could be stifled. This would be more likely to happen in auctions where the bid prices are raised to irrationally high levels.
- High auction costs might increase the risks of investment and in turn increase the financing cost for such business. Again, this could affect the speed and scale of rollout.
- Applicants might “over-bid” because they are not just bidding a figure based on a proportion of the net present value of the 3G business case. In the German or UK 3G auctions, some observers suggest that many bidders were bidding for strategic reasons, because of the way analysts valued their share prices, or (in the case of incumbent operators) to protect their existing second generation (2G) businesses. Such over-bidding might eventually stifle developments in 3G services.
- Some auctions have “failed”, either because of lower than expected pricing, bidder default or collusion.
- Bidders may bid for licences as a speculative asset or with no intention of building a network themselves.

2.2.9 Although there are tangible benefits in a cash auction, the TA considers that there are also risks in a pure “cash auctioning” approach. Such risks might delay the rollout of 3G services and adversely affect the economic development of Hong Kong.

Reverse Auction

2.2.10 “Reverse auction” was not an option specifically identified in the first consultation paper, but has been discussed in detail in the industry since the initiation of the consultation exercise.

2.2.11 A “reverse auction” is a process whereby bidders compete, for example, on wholesale prices for network capacity – the lowest price commitments win. Instead of paying an amount to the Government for the valuation of the spectrum, the bidders in this type of auction commit to wholesale prices for the delivery of 3G services on the network they operate. If the bidding process is successful and effective, this option is expected to produce the highest economic and consumer benefits as the bulk of the “monopoly rent” in the operation of the 3G spectrum would be channelled to the consumers.

2.2.12 A “reverse auction” has certain attractions:

- Operators win the auction based on criteria which are designed to benefit consumers.
- Provided that objective criteria can be set, the allocation process can be said to be relatively transparent and licences should go to those operators with the best business cases.

2.2.13 However, there are a number of problems with the implementation of this method at this point in time:

- 3G is still a service to be created in the future. Demand, rollout paths and even the overall business model are still highly uncertain at this point in time. The criteria on which applicants make their bids may subsequently be found to be sub-optimal or unnecessary.
- If the 3G opportunity is greater than operators predict, then the milestones committed to in the auction would have been reached anyway.
- But if the opportunity is less than expected, operators would be committed to tariffing or rolling out incremental stages of a network on an unprofitable basis, resulting in sale, merger or liquidation.
- For the same reason, as 3G services are not clearly defined at this stage, the TA finds it difficult to design an effective bidding process for a “reverse auction”, and for the bidders to set the bid price right. The risk of the Government not achieving its desired result of securing a competitively low price for consumers cannot be underestimated, i.e. the risk of the selection method not producing the expected results.

2.3 Proposed Approach

2.3.1 As discussed above, there are merits and demerits in the three basic options. The TA considers that there are significant risks and drawbacks in adopting any of the “purist” options, whether by spectrum auctioning based on cash, selection by “beauty contest” or a “reverse auction” on the wholesale prices of 3G services. To better achieve the primary objectives of promoting the development of the telecommunications industry and maximising consumer benefits, the TA proposes a hybrid option including the elements of pre-qualification, spectrum auction and “open network” requirement, as described below.

Stage 1 – Pre-qualification

2.3.2 Applicants would need to submit, for the assessment of the TA, their business plans and proposed commitments in order to proceed to the next round of the licensing process. This pre-qualification process would require the applicants fulfilling the following minimum requirements:

- Submission of a detailed statement which would be able to substantiate the bidder’s financial and technical capability to roll out and operate a 3G network in Hong Kong.
- Submission of a business plan in a stipulated format which demonstrates such financial and technical capability together with proposals as to network rollout, service level and coverage.
- Submission of an agreement (to be incorporated into the terms of the 3G licence if granted) to a minimum level of rollout across the Hong Kong Special Administrative Region (HKSAR) over a period of five years, and (if the applicant is a 2G operator or affiliated company) the provision of domestic roaming by that 2G operator to any 3G new entrant (see section 4.7).
- Provision of financial guarantees to ensure that the capital required to support these minimum rollout conditions will be provided.
- Submission of an agreement (to be incorporated into the terms of the 3G licence if granted) on the “open network” requirements as described in paragraphs 2.3.5 to 2.3.16 below and a proposal on how this would be implemented in the proposed network and business plan.

- Lodging with the Government of a specified amount of deposit which may be forfeited if the bidder should violate the bidding rules or fail to take up the licence after winning the auction.

2.3.3 Pre-qualification would involve applicants reaching a threshold level before they may enter the auction process in Stage 2. However, any bids exceeding the threshold level would not have an effect on the allocation by auction.

Stage 2 - Auction

2.3.4 Applicants who have pre-qualified would be invited to bid in an auction for a 3G licence. There are a number of variants in the auction process itself as described in section 2.5 below. The bidders who offer the highest payment to Government would be granted 3G licences.

“Open Network” Requirement

2.3.5 The “open network” requirement is related to the concept of separating service provision from network operation raised in the first consultation paper. In paragraphs 5.15 - 5.18 of that paper, the TA invited comments from the industry about this concept and whether it should be implemented for the 3G mobile services.

2.3.6 Submissions supporting the proposals accepted that separation of service provision from network operation would allow customers to access the full variety of 3G services and stressed the importance of non-discriminatory access to networks by Mobile Virtual Network Operators (MVNO). They were of the view that TA should ensure that there would be no regulatory barriers that would hinder MVNO development. The TA should regulate the network operators ensuring non-discriminatory access to their networks by service providers and to minimize collusion among big players who were network operators as well as service providers. Some submissions were of the view that separation should not be mandatory and should be subject to market forces. One submission suggested that as many as 20 MVNOs be licensed by auction enabling a larger number of companies in different trades to enter the 3G services market.

2.3.7 The parties expressing concern about the MVNO arrangement included nearly all incumbent operators (except one). Their concerns were about the potential technical and financial difficulties for physical network operators to meet this requirement. Such separation is

equivalent to opening the networks to all competitors and it is technically inefficient for the network operators to rollout and maintain networks with an unknown requirement in terms of capacity just for the purpose of offering it to service providers. This would jeopardize the business viability of the network operators. One submission considered that mandatory separation is not viable and MVNO relationship should be achieved through commercial negotiation.

2.3.8 One incumbent considered that 3G infrastructure investment rests on the ability to generate sufficient revenue more broadly across the value chain of services delivered over the 3G networks, not just from access and carriage. The operators would not refuse the service providers from using their 3G infrastructure to deliver services at competitive prices, especially in the presence of other competing networks and technologies. Another incumbent considered that the future 3G value chain would allow customers to access service and content providers. The need for MVNO might not even exist.

2.3.9 The TA notes that most submissions support the concept of separating service provision from network operation and agree to the benefits that would be brought to the customers. Despite the reservation expressed by some incumbent network operators, they did not disagree to allowing other service providers to have access to their networks. The major consideration lies on whether such access should be mandated or left to commercial negotiation.

2.3.10 As stated in paragraph 2.3.1, the TA intends to introduce “open network” as an essential element in the approach for the selection of operators. This approach would protect consumer interest by introducing more competition at the content and application level and would minimize the possibility of the price paid for the spectrum in the auctioning approach being passed on to the consumers. To implement such an “open network” requirement, it is necessary to separate service provision from network operation and to institute some sort of regulatory intervention in the determination of wholesale prices if commercial negotiation fails.

2.3.11 In the proposed licensing framework by the TA, the licensees, as network operators, will be required to open up their 3G networks to 3G service providers. This would not extend to any of a licensee’s 2G networks, if the licensee is also a 2G network operator - it is specific to the licensee’s 3G networks. As discussed in Part III, the number of licences to be issued for network operation will be limited by spectrum availability. The concept of separating network operation from service provision will

better meet the Government's policy objective of introducing more competition at the content and service application level. In particular, such an arrangement will greatly benefit the development of innovative, small and medium size application houses and service providers in Hong Kong. It would also allow room for all incumbent 2G operators to take part in the 3G business even if they lose out in the licence bidding process for 3G network operation.

2.3.12 The "open network" requirement allows the network operators themselves to be service providers at the same time. As content and service applications are expected to be the major revenue sources in 3G business, the network licensees may retain certain network capacity for their own use or use by their affiliated companies for service provision. However, the network licensees will be required to open a minimum amount of network capacity to non-affiliated service providers.

2.3.13 The mode of operation of such service providers could take the form of "MVNO" or simple "resellers". A MVNO is expected to own and operate part of the mobile network, e.g. switches, Home Location Registers, etc. and have access to the base stations of the physical network operators. A "reseller" would simply buy airtime or capacity in bulk quantity from the network operators and resell the same to customers under their own brands.

2.3.14 The preliminary view of the TA on the percentage of network capacity to be open to any non-affiliated service providers (whether MVNOs or resellers) lies in the range of 30% to 50%. This availability of capacity to non-affiliated service providers would be assessed in the busiest cells during the peak traffic hours. **Industry feedback on what they consider as a reasonable percentage is sought to assist the TA in making a final decision.** The percentage should not be too low as to render the open network requirement meaningless; nor too high to discourage investment incentives.

2.3.15 Regarding the wholesale price of the 3G network licensees to MVNOs and resellers, it is the initial view of the TA that he prefers to leave it first to commercial negotiations among the parties. The TA will only intervene when such negotiations failed and he is requested to make a determination under the interconnection provisions of the Telecommunications Ordinance. In making such a determination, the TA would consider economic principles based on both the "retail minus" and "cost plus" approach. The "retail minus" approach would be based on the retail price of the services provided by the network operator or its affiliated

service provider in the market minus the cost of providing the services by the network operator or its affiliated service provider. A competitor would be able to compete with the network operator or its affiliated service provider (by offering the same or lower retail prices) if the competitor is as efficient, or more efficient, in the service provision. The “cost plus” approach would be based on the relevant long run average incremental cost in operating the network and providing the conveyance service including an appropriate cost of capital commensurate with the risk of investment in a 3G network. **The TA is prepared to consider submissions on which is the industry’s preferred approach.**

2.3.16 In meeting the “open network” requirement, the 3G licensee will be required to treat its own or affiliated service providers and the non-affiliated service providers on a non-discriminatory basis. Accounting separation requirement will be incorporated into the 3G licence conditions to enable the monitoring by the TA of such non-discriminatory treatment and to facilitate the determination of wholesale prices of the network if required.

2.4 Merits of the Proposed Licensing Approach

2.4.1 The advantages of the proposed hybrid approach are as follows:

- It ensures that only applicants who are willing and able to build out a 3G network are permitted to bid.
- It protects consumer interest in that minimum levels of 3G rollout across the HKSAR will be achieved by certain dates.
- It still lets the market decide in an objective manner which applicants value 3G licences the most.
- The “open network” requirement protects consumers interest by minimizing the possibility of the spectrum price being passed onto the consumers as the TA retains the regulatory option of regulating the wholesale price for the conveyance service over the networks.

2.4.2 **The TA welcomes comments on his preferred hybrid auction approach as described above.**

2.5 Auction Processes

2.5.1 There are four methods by which applicants might be expected to bid in an auction:

- Upfront lump sum
- Deferred payment
- Royalties
- Royalties with guaranteed minimum payment

2.5.2 The TA is keen to find a payment mechanism which is simple to assess, simple to administer, and reduces credit risk thereafter. At the same time, he is also keen to ensure that any potentially negative effects on consumer pricing, market competitiveness and 3G rollout are avoided or minimised.

2.5.3 *Upfront lump sum*

2.5.3.1 This is the mechanism which was adopted in a number of European countries using the “spectrum auctioning” approach in licensing 3G services. It involves the winning bidders paying for their licences within a short period of winning the auction in full and in cash. A large deposit placed before the auction provides sufficient certainty that the winning bidder(s) do(es) not default in the intervening period between licence award and payment.

Advantages

2.5.3.2 This approach has the following advantages:

- The Government takes little or no credit risk on bidders.
- Payment default by an operator, or pressure to renegotiate payment is impossible once the upfront payment is made.
- It is simple to administer.
- Prices achieved are bid by operators “with their eyes open”.

Disadvantages

2.5.3.3 This approach has the following disadvantages:

- The upfront cash payment would represent a form of tax in advance of service rollout.
- Many argue that an upfront cash payment would inevitably be passed on to 3G customers and would hinder 3G network rollout.
- It might rule out the participation of small, innovative but financially less strong operators to take part in 3G network investment.

2.5.4 *Deferred Payment*

2.5.4.1 One alternative to an upfront fee might be for all or a part of it to be deferred. The deferred payments could be structured as a number of payments over time on a straight line or inflation-adjusted basis. Potentially the deferred payments could be structured in such a way that the bulk of the obligation to pay would fall in a period after the operator's peak financing requirements.

Advantages

2.5.4.2 This approach has the following advantages:

- A deferred payment may reduce an operator's total financing requirement if properly constructed and might be more conducive to the participation of smaller companies in the bidding exercise.
- If the deferred payment is a sum certain and guaranteed, it can act as a "sunk cost" to the same degree as an up front lump sum payment.

Disadvantages

2.5.4.3 This approach has the following disadvantages:

- Unless a deferred payment is guaranteed, the operator may consider it has an option to default and hand back the licence if the 3G business case is poorer than expected.
- If the Government removes its credit risk by taking a third party bank guarantee, that (a) may create a significant financing charge to the operator and (b) will count at least as a contingent liability on that operator's balance sheet and hence restrict its access to further finance. For a bank to provide a guarantee in respect of an operator with weaker credit risk over a 15-year period, it may need to provide cash backing.

In these circumstances a guaranteed deferred payment would possibly cost as much as, if not more than, conventional financing of an up-front cash payment.

- The Government ought, strictly, to factor into each payment an implicit financing charge for its deferred nature. If the discount rate at which the Government is indifferent to a guaranteed deferred payment or an upfront cash payment is higher than the operator's marginal cost of capital, then it is unlikely that the operator would want to pay on a deferred basis. It is thought that for this reason optional deferred payments were not taken up by any successful bidder in the UK auction.

2.5.5 Royalties

2.5.5.1 In a royalty auction, the applicants bid on the percentage of turnover or profit which they pay over to Government over the licence term.

Advantages

2.5.5.2 This approach has the following advantages:

- A royalty in theory allows Government and the operator to share the upside and the downside of the 3G opportunity. Given:
 - the wide range of 3G services potentially available and unproven levels of demand for each product; and
 - the uncertain split of data usage between the second-and-half generation (2.5G) and 3G,

the revenues from 3G services cannot be predicted with accuracy. Royalties payable over the life of the licence therefore adjust payments to the actual turnover.

- The use of a royalty reduces the variability in the net revenue retained by a operator and hence reduces the total risk faced by it. Because of this “insurance premium”, the total expected payment which a risk-averse firm would be willing to offer in an auction under its base case scenario may increase if a royalty is offered instead of a lump sum payment.

Disadvantages

2.5.5.3 This approach has the following disadvantages:

- A royalty levied on an operator's turnover acts as a type of "sales tax" and is likely to affect the way in which an operator sets consumer prices, because it changes the point at which the operator matches incremental revenue to incremental cost. In economic terms it is likely to shift the supply curve of the operator upwards, although the effect that this has on volume supplied and pricing is highly dependent on the elasticity of consumer demand.
- Ideally the Government would wish to charge royalties on the profits of operators rather than their revenues. That ought to prevent royalties affecting volume or price of 3G services. However, it is too easy for a company to misrepresent its profit through cross-subsidisation, hence turnover being probably the most appropriate measurement.
- It may be difficult to assess what revenues are attributable to 3G services and which are attributable to 2G services provided by the same operator over a dual mode handset, although the TA believes that manufacturers should be able to include functionality which permits this.
- If royalties are set at a high rate, they could distort the way in which 3G services are offered – i.e. there may be an incentive on operators to provide 2.5G services wherever possible.
- It would be difficult for the TA to determine, say, whether one operator's royalty rate of 3% is better than another's royalty rate of 6% due to differences in credit quality and perceived future revenues. This could create undue subjectivity to the auction process.
- As with a deferred payment, there is a risk that operators who find their 3G business is unprofitable seek to renegotiate the royalty rate with the Government at such later time. A bank guarantee or performance bond would mitigate this, but would be expensive to put in place as the maximum amount guaranteed is unascertainable in advance.

2.5.5.4 Due to the uncertainties and the risks involved, the TA does not favour a pure royalty payment approach. Instead, he considers the following variant to be a viable alternative to lump sum cash payment, upfront or deferred.

2.5.6 Royalties with Guaranteed Minimum Payment

2.5.6.1 To overcome the financial risk borne by the Government in a pure royalty approach, it is possible to require a minimum annual payment that the licensees would need to pay the Government irrespective of its turnover. However if the turnover grows to a point that the royalty calculated using the percentage bid in the auction exceeds the minimum payment, the licensee would need to pay the additional royalty over and above that of the minimum payment. The Government would require a 5-year rolling guarantee of the minimum annual payment.

Advantages

2.5.6.2 This approach has the following advantages:

- Government caps to a large extent the downside risk by setting a guaranteed minimum payment, while sharing the upside benefits with operators. On the other hand operators do not need to come up with a hefty upfront payment.
- There is a lesser need for upfront financing/provision of guarantees than under a straight cash auction. That should enable some capital constrained bidders to bid where otherwise they might not have been able to do so.
- The Government is still able to call on a bank guarantee for a minimum amount in the event of operator insolvency or default.
- With a minimum guaranteed payment, there is no need to calculate potential royalties from particular operators for assessment in the bidding which would likely be based on highly uncertain assumptions.

Disadvantages

2.5.6.3 This approach has the following disadvantages:

- There are likely still to be distortive effects on the market, but these will be reduced by the amount of the minimum payment.
- The Government may still find that operators in financial difficulties might attempt to renegotiate royalty rates in the future.

- There remains a credit risk on individual operators relating to the additional royalty over the guaranteed minimum payment.

2.5.7 The TA welcomes comments on whether bidders would prefer to pay for licences through an upfront cash payment, deferred cash payment, or the royalty payment with minimum guaranteed payment as proposed.

2.6 Auctioning Rules

2.6.1 Whilst the TA wishes to see the allocation process open to as many applicants as possible, he also needs to ensure that:

- bidders are separate and unconnected entities;
- future competition in the Hong Kong market is not restricted by the outcome of the allocation process; and
- there are no incentives for bidders to collude or to avoid bidding against each other by reason of their connected interests.

2.6.2 Similarly, he recognises that there are many cross-ownership interests in the international telecommunications markets and that international merger and acquisition activity will not stop during the auction period.

2.6.3 It will therefore be necessary for the TA to formulate detailed rules for inclusion in the invitation document which would restrict bidding by connected parties, allowing only one of such parties to bid.

2.6.4 Apart from rules that deal with connected parties in the auction process, it is also necessary to design the actual procedures of the auction process itself to ensure that it is not compromised. There are a number of different ways that an auction could proceed, e.g. sealed bids, ascending auction, descending auction or a hybrid of such methods. The current thinking of the TA is to adopt the multi-round ascending auction mechanism which has been used in the UK and Germany 3G auctions.

Part III – Spectrum Width per Operator and Number of Licences

3.1 Proposal in First Consultation Paper and Views from Submissions

3.1.1 These two issues are inter-related as the number of licences which may be issued depends on the width of the spectrum assigned to each operator.

3.1.2 For an optimal 3G radio network, the network should be planned using a 3-layer hierarchical cell structure using macro, micro and pico cells. A new operator would need an allocation of paired spectrum for macro cell operation, but an existing 2G operator may upgrade its 2G system to provide the macro layer. For this reason, the TA's preliminary view in the first consultation paper was that the minimum spectrum width requirements for a new operator and an existing one were 2 x 15 MHz and 2 x 10 MHz respectively.

3.1.3 In the first consultation paper, the TA has considered the following licensing options concerning the number of licences and the treatment of new entrants in the licensing exercise:

Option 1: The existing mobile operators and new entrants will be given an equal opportunity to compete for the four new 3G licences. Each operator will be allocated with 2 x 15 MHz paired, with one 5 MHz unpaired spectrum to be reserved for each licensee for allocation at a later stage. Four licences can be accommodated in this option.

Option 2: While the new entrants and the existing operators will, as in Option 1, compete on the basis of the same set of selection criteria, instead of giving the same width of spectrum to each of the new and incumbent operators, an incumbent operator who is successful in its bid for the licence will be allocated 2 x 10 MHz paired spectrum whereas a new entrant will be allocated 2 x 15 MHz paired spectrum. Another 5 MHz unpaired spectrum will be reserved for allocation to each operator at a later stage. The number of 3G licences to be issued will vary from four to six, depending on the mix of new entrants and incumbents who are successful.

Option 3 : The TA will reserve part of the 3G spectrum to new entrants only and the remaining part to the incumbents. Similar to Option 1, each operator (incumbent or new entrant) will be allocated 2 x 15 MHz paired, with one 5 MHz unpaired spectrum to be reserved for allocation to each licensee at a later stage. This option allows a "mix" of four new and existing licensees to operate the 3G services. If this option is pursued, the TA needs to decide on the mix (e.g. two new entrants plus two incumbents, or one new entrant plus three incumbents, etc.).

Option 4 : Like Option 3, the TA will reserve part of the 3G spectrum to new entrants only. However, instead of giving the same width of spectrum to each of the new and existing operators, an incumbent operator who is successful in its bid for the licence will be allocated 2 x 10 MHz paired spectrum whereas a new entrant will be allocated 2 x 15 MHz paired spectrum. Another 5 MHz unpaired spectrum will be reserved for allocation to each operator at a later stage. The number of 3G licences that can be issued will be increased to five, whether the mix is two new entrants plus three incumbents, or one new entrant plus four incumbents.

3.1.4 In paragraph 3.21 of the first consultation paper, the TA was of the view that there may be no immediate need to make a decision on the allocation of the unpaired 3G spectrum. The TA therefore proposed that he would not allocate the unpaired spectrum at the initial stage, but he would reserve the spectrum for use by the licensed 3G operators and would further consult these operators when it is timely to allocate this spectrum.

3.1.5 Some submissions cast doubt on the feasibility of using the 2G systems to provide the macro layer of the 3G networks. They argued that this approach would result in degradation of quality of service to existing 2G customers, particularly in the 2.5G services which are more demanding in spectrum requirement.

3.1.6 Some submissions were of the view that with the assignment of 5 MHz of unpaired spectrum to an operator, the operator would be able to operate a 3-layered cell hierarchy in their networks even if 2 x 10 MHz is assigned in the paired spectrum. In this manner, six operators could be licensed in the bands for 3G services.

3.1.7 The majority of the submissions had a different view from that of TA in the reservation/assignment of the unpaired spectrum. They pointed out that all regulatory authorities in Europe have allocated the unpaired spectrum together with the paired spectrum to the licensees at the same time and that the operators would need to plan the network and business rollout at the outset. Although the development in the 3G unpaired spectrum appears to be lagging behind that in the paired spectrum, there would be merits in allocating the unpaired 3G spectrum to the licensees in the initial phase in order to maximize spectral efficiency to cater for asymmetric services. Some submissions also pointed out that doing so would also give the industry greater certainty regarding the conditions they will face in the new environment and enhance their willingness to invest.

3.2 Discussions

3.2.1 The TA recognises that uncertainty exists as to the use of the 2G/2.5G networks for the macro-cell layer of the 3G networks. Without sufficient spectrum to operate the 3-layered 3G networks, operators might have to compromise on network capacity and performance. Although the 5 MHz unpaired spectrum allocation could theoretically ameliorate such restrictions, the timing for the availability of equipment operating in the Time Division Duplex (TDD) mode is still uncertain. The TA considers it undesirable to introduce capacity constraints in the rollout of the 3G infrastructure in the initial years of operation of the 3G services.

3.2.2 The TA has also considered the requirement to provide sufficient capacity to each licensee now that it is intended to mandate the “open network” requirement, as part of the capacity would be made available to competitors on a non-discriminatory basis.

3.2.3 The third consideration is that there might be difficulty with classifying an operator as being “new” or “existing” if acquisition or mergers should take place in the market after the initial assignments have been made.

3.2.4 For the above reasons, the TA considers that the width of paired spectrum assigned to each operator should be 2 x 15 MHz and that there should not be a distinction drawn between existing and new operators.

3.2.5 Taking into account the views received on the allocation of the unpaired spectrum, the TA considers that there are merits in allocating the unpaired spectrum at the outset. The TA would allocate one unpaired 5 MHz block together with the paired spectrum to each of the 3G licensees.

3.3 Proposal

3.3.1 Based on the above discussions, the TA considers that four licences should be granted in this round of licensing. Each licence is awarded 2 x 15 MHz paired spectrum plus 5 MHz unpaired spectrum.

Part IV – Other Regulatory Issues

4.1 Treatment of New Entrants

4.1.1 In paragraph 4.3 of the first consultation paper, the TA considered that there are grounds for considering admission of new entrants into the market to compete with the incumbent operators. The TA put forward two options in which existing operators and new operators would bid for the licences on an equal basis, and two other options in which a number of licences available would be reserved for new operators (see paragraph 3.1.3 of this paper).

4.1.2 The TA's intention of introducing new entrants was generally supported by the submissions except two who argued that Hong Kong market could not accommodate new entrants. Those who supported the TA's intention were of the view that the admission of new entrant(s) to the 3G mobile market is essential to bring in new innovative services and increase market competition and it will be beneficial to both market development and consumers. However, there were divided views on whether the incumbents and new entrants should be treated on the same basis in the bidding process.

4.1.3 Some argued that certain parts of the 3G spectrum should be reserved for new entrants. Others argued that new entrants and incumbents should be given the same opportunity to bid for the licences in all parts of the 3G spectrum. Some argued that the distinction between new entrants and incumbents might not be sustainable as consolidation might take place between new entrants and incumbents after licensing.

4.1.4 The TA notes that it is uncontroversial that new entrants should be allowed to participate in the bidding process for the licensing of 3G operators. The only contentious issue is whether spectrum should be reserved for bidding only by the new entrants.

4.1.5 The TA considers that in other countries which have reserved spectrum for a new entrant, the mobile market may not be as competitive as that in Hong Kong. Most of them have only up to four operators in the 2G market. It is therefore understandable that these jurisdictions considered it desirable to enhance the level of competition in the market by reserving spectrum for new entrants to enter the market.

4.1.6 In Hong Kong, the level of competition in the market for 2G services is very intense. There are already six operators in the market

which is higher than in other markets. Thus there is less need to design a licensing process for the admission of new entrants.

4.1.7 The TA is therefore of the view that the incumbents and the potentially new entrants should be given the same opportunity in the bidding process, i.e. no spectrum should be reserved for the new entrants in the bidding process.

4.2 3G Standards in Hong Kong

4.2.1 The preliminary view of the TA in the first consultation paper was to extend the technology-neutral approach in the licensing of the Personal Communications Services (PCS) to the licensing of 3G services. In paragraph 2.7 of the first consultation paper, the TA stated that he did not see the need to mandate a single radio interface standard for 3G services and that he would leave the choice to commercial decisions of operators so long as the chosen standard is one of the IMT-2000 (International Mobile Telecommunications – 2000) standards adopted by the International Telecommunication Union (ITU). On the other hand, in paragraph 2.8 of the first consultation paper, the TA stated that he was interested to promote the adoption of technical standards that are compatible with each other from the users' point of view in order to facilitate competition between networks and to maximize user convenience in using roaming services without having to change the mobile terminals. Furthermore, the choice of 3G standards will have to be constrained by the band plan in Hong Kong.

4.2.2 The principles proposed by the TA have received the general support of those parties who have commented on this issue. Some submissions pointed out that it is unlikely that mobile terminals compatible with more than one 3G standard adopted by the ITU would be available in the initial years. The TA's requirement that the users should be able to switch networks without having to change the mobile terminals would mean that the TA would be encouraging the use of one 3G standard in Hong Kong.

4.2.3 Some submissions suggested that the adoption of multiple standard in Hong Kong might result in the requirement for guard bands between the bands used by networks of different 3G standards which would reduce the amount of usable spectrum.

4.2.4 The TA has noted these comments. With the proposal that only four 3G networks would be licensed in Hong Kong, it would even be

more important that standards of the different operators are compatible with each other from the users' point of view so that the users would have a sufficient choice of networks.

4.2.5 It is anticipated that from the commencement of operation, the mobile terminals for the 3G services would have to be of a dual mode design to enable backward compatibility with the 2G networks. Thus the availability of equipment to be backward compatible with the existing 2G networks in Hong Kong would be a constraint in the selection of 3G standards by operators.

4.2.6 The TA expects that the operators would take these requirements into consideration in their choice of the 3G standards and put forward their chosen standard(s) in the licence applications.

4.2.7 The TA affirms the views that the prospective operators should be permitted to use any IMT-2000 standards adopted by the ITU within their assigned 3G frequency bands for 3G mobile services, subject to the TA being satisfied that the various technical standards are compatible with each other from the users' point of view.

4.3 Availability of 3G Spectrum in Hong Kong

4.3.1 In paragraph 3.4 of the first consultation paper, the TA advised the industry that the spectrum allocated by the ITU for 3G services will be available for use in Hong Kong and Hong Kong will follow the band plan recommended by the ITU. Figure 2 in the first consultation paper gave the proposed band plan for 3G services in Hong Kong.

4.3.2 There was no disagreement with the spectrum allocation proposed in the first consultation paper. The TA will develop the band limits for individual operators based on the number of operators and the 3G standards adopted.

4.3.3 In paragraph 3.5 of the first consultation paper, the TA indicated that he would consult the industry again on the allocation of the bands for the expansion of 3G services in Hong Kong when there is further development in the ITU on this matter.

4.3.4 The ITU, in the World Radiocommunication Conference 2000 held in May 2000, has allocated additional spectrum for 3G services. The spectrum includes new bands for mobile services in the 2,500 - 2,690 MHz range as well as the 806 - 960 MHz and 1,710 - 1,885 MHz bands

currently occupied by 2G services. Possible allocation of the 2,500 – 2,690 MHz band for 3G services in Hong Kong would first be discussed in the Radio Spectrum Advisory Committee (RSAC) convened by OFTA. It is not expected that this band would be available for 3G or similar services within the next three years. Another full consultation will be initiated on how the band should be allocated at that time if a decision is made on allocating the band for 3G or similar services. The 806 – 960 MHz band and the 1,710 – 1,885 MHz band are dealt with in the section below as they are currently used by 2G operators.

4.4 3G Services in 2G Spectrum

4.4.1 Paragraph 3.8 of the first consultation paper stated the TA's intention to open to the existing operators, whether they are successful or not successful in obtaining 3G spectrum, to use any IMT-2000 standards within their assigned 2G frequency bands for 3G mobile services, subject to the TA being satisfied that the various technical standards are compatible with each other from the user's point of view and that the interest of existing 2G consumers is adequately safeguarded.

4.4.2 The majority of the submissions which commented on this issue supported the TA's proposal. They considered that this is the natural evolution path for incumbent operators to provide 3G services and would allow efficient utilization of their assigned spectrum. This proposal would also allow those incumbent operators failing to obtain 3G licences to provide 3G services within their assigned 2G bands to enhance competition in mobile services.

4.4.3 A few submissions had different views on the issue. One submission considered that allowing the incumbent operators to operate 3G services in the 2G bands would in effect guarantee the incumbent operators the right to operate 3G services even if they failed to obtain a 3G licence or decided not to apply for the licences. This is unfair to the other licence applicants and the problem would be profound in the initial phase of service launch when the full range of services are not yet available. One submission suggested that the incumbent operators should pay a premium, to be levied through a mechanism similar to the variation of land leases, in return for the right to provide 3G services in the 2G bands. There was also a view that, as 3G services would not be mature until 2005, the incumbent operators could wait for equipment availability to provide 3G services in their 2G bands. If 3G spectrum were granted to them, they should return their 2G spectrum to the TA.

4.4.4 Having considered the views in the submissions, the TA considers that allowing the incumbents to make use of the 2G spectrum for 3G services would provide a natural evolution path for the incumbent operators and enable efficient utilization of the radio spectrum. It has also been the policy of the TA to allow licensees to use technologies that they consider most efficient (i.e. technology neutral licensing). The TA does not therefore have any objection in principle to the existing 2G operators to making use of their own 2G spectrum for 3G services during the validity period of their existing licences. Regarding the question of how to deal with the 2G licences when they expire, it will be the subject of another consultation nearer the time.

4.5 Mandatory 3G Mobile Number Portability

4.5.1 In paragraph 5.19 of the first consultation paper, the TA stated his intention to include the implementation of mobile number portability (MNP) as a mandatory requirement under the conditions of the 3G licences.

4.5.2 Nearly all submissions supported TA's proposal. It was generally agreed that MNP safeguards the interests of customers by removing one of the fundamental barriers for free customer choice. From the user's point of view, MNP would enable 2G customers to retain their current numbers when migrating to 3G services.

4.5.3 Two submissions opined that the implementation schedule of MNP for 3G services should be decided by the operators. One of them considered that mandating MNP at service launch might delay the service rollout, which is not beneficial to the society.

4.5.4 The TA firmly believes that MNP is an essential element in protecting the interests of the consumers. Since the implementation of MNP in March 1999, there were over one million portings. The number of portings shows the popularity of the service in the competitive environment of the mobile industry. Consumers would naturally expect MNP to be available for 3G services. The TA therefore affirms the view stated in paragraph 5.19 of the first consultation paper that MNP should be a mandatory requirement for 3G services. As regards the implementation schedule for MNP, the TA considers that MNP should be available from the launch of 3G services in order to bring maximum benefits of MNP to consumers. If necessary, the TA will set up a specialist group working on the technical difficulties which might hinder early implementation of MNP for 3G services.

4.6 Numbering Requirement

4.6.1 In paragraph 5.20 of the first consultation paper, the TA stated his intention to allocate the leading digit “6” primarily for 3G services. Some submissions proposed that the current practice of allocating numbers with prefixes “6” and “9” to mobile services should continue. One submission proposed that it is not necessary to specifically reserve prefix “6” numbers for 3G at the expense of 2G services which would continue to grow significantly in the near future. In addition, it is not necessary to distinguish between 2G and 3G services by the number prefix. Through MNP and growth in 3G services, the numbers with prefix “6” and “9” could be used for both services. The Universal Mobile Telecommunications System (UMTS) Forum had identified the need to ensure adequate numbering and addressing space for wireless Internet in the 3G environment. The UMTS Forum would issue a paper on this subject later this year.

4.6.2 In the Hong Kong Numbering Plan, both number levels “6” and “9” are allocated to the mobile services. The TA agrees to the views that the branding of 2G and 3G services by number prefix is not necessary as users of both services are free to port their numbers across networks of both generations through MNP. Thus the number levels of “6” and “9” should be usable for 2G and 3G services and 2G users should be able to keep their existing telephone numbers upon upgrading to 3G services.

4.6.3 With a mobile population over four million and the continued growth in mobile penetration, the TA is concerned whether number consumption in these number levels would affect the availability of sufficient number resources for the future 3G services. The availability and possible reservation of numbering resources for the 3G services will be further discussed in the Telecommunications Numbering Advisory Committee (NAC) convened by OFTA.

4.7 Domestic Roaming between 3G and 2G Networks

4.7.1 In paragraphs 5.13 of the first consultation paper, the TA invited views from the industry on whether 2G operators successful in obtaining 3G licences should allow mandatory roaming into their networks by customers of the new entrants in the 3G market, in order to enable the new entrants to compete effectively with the incumbent operators in the 3G market.

4.7.2 The submissions in general had no objection to the proposal of providing roaming service by the 2G operators (who are also 3G licensees) to the customers of 3G new entrants. However, there were divided views as to whether this should be achieved through regulatory intervention or commercial negotiations. Those in support of regulatory intervention considered that the TA should set up an environment for effective competition from 3G new entrants and that the roaming should be mandatory for a limited period in order to encourage the new entrants to roll out their networks. Those in support of reliance on market forces considered that the industry would develop better without unnecessary regulatory intervention.

4.7.3 Having considered the views in the submission, the TA affirms the view that mandatory roaming from 3G to 2G networks would promote effective competition between the new entrants and the incumbents 2G/3G operators during the initial period when the 3G networks of the new entrants are still being rolled out. Therefore he intends to include this domestic roaming requirement as an obligation under the 3G licences issued to incumbent operators. As part of the proposed pre-qualification process, incumbent operators will be required to signify acceptance of this obligation should they be successful in obtaining 3G licences (paragraph 2.3.2 of this paper).

4.7.4 To provide sufficient commercial incentives for the 3G new entrants to roll out their own networks, there should be a “sunset” date when the roaming arrangement would end. A possible “sunset” date could be, say, five years after the new entrant(s) has launched its service.

4.7.5 In paragraph 5.14 of the first consultation paper, the TA invited views from the industry on whether roaming arrangement from 2G networks to 3G networks should be implemented. There was only one submission responding to the issue. The submission supported that roaming arrangement from 2G to 3G networks should be implemented.

4.7.6 Roaming from 2G to 3G networks effectively allows the 2G operators to become service providers for 3G services. The customer must of course be equipped with the mobile terminal compatible with the 3G services for the roaming to be feasible. This is similar to the concept of separation of service provision from network operation which has already been addressed in paragraphs 2.3.5 – 2.3.16 of this paper.

4.8 Regulatory Framework

4.8.1 In paragraphs 5.1 - 5.12 of the first consultation paper, the TA invited views from the industry on whether the same regulatory framework for 2G services should be applied to 3G services. The TA also sought views from the industry on the timing to review the current framework in view of fixed-mobile convergence.

4.8.2 Most of the comments on these issues came from the telecommunications industry players. The majority of the comments received were of the view that 3G services may be regulated under similar regulatory framework as 2G services and there is no need for additional regulation and 3G services are natural evolution from 2G services.

4.8.3 Some submissions supported the adoption of a different regulatory framework for 3G services in order to encourage innovation and ensure effective competition. They were of the view that there is a need to ensure the dominant players, which in the future 3G market may include content providers, do not abuse their position and do not unduly influence the market by way of their market power. Some mentioned that regulation may be required but only focus on interconnection issues between 2G and 3G networks.

4.8.4 On the fixed-mobile convergence issue, some submissions considered that fixed and mobile sectors are on the trend of convergence. The distinction between fixed and mobile operations is becoming increasingly blurred. Therefore, both fixed and mobile operators should have the same rights and obligations and there is no need for regulatory distinction between the two. However, some commented that the current regulatory distinction between the fixed and mobile sectors is sufficient and necessary. There is no need at this time to remove it. Some recommended that this issue be dealt with as a separate issue. Some submissions considered that the fixed and mobile operators should be regulated under their respective licences until the interconnection regime for the fixed and mobile sectors is unified.

4.8.5 Having considered the submissions on this issue, the preliminary conclusion of the TA is as follows. The Secretary for Information Technology and Broadcasting is now consulting on the implementation of carrier licences under the Telecommunications Ordinance. The consultation paper can be downloaded from the website of the Information Technology and Broadcasting Bureau at <http://www.info.gov.hk/itbb/> or OFTA's web site at <http://www.ofta.gov.hk>.

It is intended that 2G and 3G services would be regulated under the carrier (mobile) licences. Although 2G and 3G services would be subject to the same general licence conditions and provisions in the Telecommunications Ordinance, it would be necessary to incorporate appropriate special conditions in the licences for 2G and 3G services. For example, special conditions applicable to the 3G services only would be required to implement the auctioning result for the allocation of 3G licences.

4.8.6 For the time being, there has to be a distinction between carrier (fixed) licences and carrier (mobile) licences because the rights and obligations between the two classes of licensees are quite different. In designing the carrier (fixed) licences and carrier (mobile) licences, the possibility of future convergence should be taken into account. For example, where the obligations of the two classes of licences are similar, similar structure and wording should be adopted in the licence conditions. This is now facilitated by the enactment of the Telecommunication (Amendment) Ordinance which applies to the fixed and mobile services and the consultation on the implementation of carrier licence would provide an opportunity for the preparation for such convergence.

4.8.7 The TA considers that there would be further opportunities to consult the industry on the question of fixed and mobile convergence and this subject might be outside the main purpose of this consultation exercise.

Part V - Way Forward

5.1 The TA invites comments on his analysis of the industry views received from the first consultation paper and his preliminary conclusions on the issues raised in this consultation paper in relation to the licensing framework for 3G mobile services. All views and comments should be made in writing and should reach OFTA *on or before 5:00 p.m., Monday, 13 November 2000*. An electronic copy of the submission in Word 97 format should be provided wherever possible.

5.2 The TA intends to publish all views and comments and to disclose the identity of the source. Any part of the submission that is considered commercially confidential should be clearly marked. The TA would take such markings into account in making his decision as to whether to disclose such information or not. Submissions should be addressed to :

Office of the Telecommunications Authority
29/F, Wu Chung House
213 Queen's Road East
Wan Chai
Hong Kong

[Attn: Senior Regulatory Affairs Manager
(Services Licensing)]

Comments may also be sent by fax to (852) 2803 5112 or by e-mail to syflam@ofta.gov.hk.

Office of the Telecommunications Authority
3 October 2000