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Agnes K. Nardi
Managing Director

Ref : AKN/cc-L034/2000

Mr Anthony Wong
Office of the Telecommunications Authority
29/F Wu Chung House
213 Queen's Road East
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Hong Kong

Dear Anthony,

**Re : Licensing Framework for Third Generation Mobile Services
An Industry Consultation Paper**

In response to OFTA's Consultaion Paper dated 21 March 2000 regarding licensing framework for third generation mobile services, we have pleasure in enclosing our comments on behalf of Hutchison Telephone Company Limited.

Yours sincerely,
For and on behalf of
Hutchison Telephone Company Limited

(Original signed)

Agnes Nardi
Managing Director



Hutchison Telephone Company Limited

Comments On the OFTA Document:

"Licensing Framework for Third Generation Mobile Services

An Industry Consultation Paper (dated 21 March 2000)"

Hutchison Telephone Company Ltd. (HTCL) welcomes the opportunity to express its interest in obtaining a license for Third Generation (3G) Mobile Services in Hong Kong and to present its views on the framework under which the license allocation process will occur.

HTCL is committed to being a 3G operator in Hong Kong; as such, we intend to compete fairly and openly to ensure that we achieve that objective. The process of license allocation selected by OFTA must be equitable to all participants and each operators' spectrum allocation must be sufficient to enable the provision of 3G services appropriate to the specific needs of the Hong Kong market.

The key conclusions of our response to the TA are:

- Spectrum auctions provide the most economically efficient and fairest mechanism for 3G operator selection.
- A minimum allocation of 2 x 15 MHz paired spectrum is required to provision the full range of 3G services appropriate to the needs of the Hong Kong market.
- Thus, of the TA's proposals, only Option 1 is viable: *equal opportunity* to compete for four licences of paired 2 x 15 MHz, with one 5MHz unpaired spectrum reserved for each licensee for allocation at a later stage.
- There can be no preference in bidding rights or spectrum allocation given to either new entrants or incumbents.
- The licenses should be awarded for 20 years to enable recovery of the initial investment.
- The evolving (and converging) nature of 3G services make it essential that the TA transition to a "lighter touch" regulatory framework with the underlying philosophy that regulation is kept to the minimum necessary to achieve appropriate outcomes.
- "Evaluation on merit" as proposed by the TA with its old fashioned "command economy" emphasis on service pricing as a key criteria under a "reverse auction" is inappropriate to the yet-to-be-defined 3G environment. It creates a significant potential to induce operators to trade inferior service quality for lower pricing levels, while variations in pricing models and quality of content in each companies' 3G business model will make pre-bid comparison unreliable and post-award performance monitoring unworkable.

Hutchison, therefore, strongly recommends the TA to adopt spectrum auction as the process for operator selection in Hong Kong. It ensures equal opportunity for all bidders and is more beneficial to Hong Kong's economy.

OFTA has structured its consultation paper with both statements of intent and requests for comments on selected issues; our response addresses each of these in sequence.

1 Introduction

OFTA:

This paper discusses various issues on the introduction of 3G mobile services and consults the industry and any interested party on these issues, prior to the finalization of the regulatory framework for 3G mobile services in Hong Kong. The TA intends to invite applications for 3G licenses in the last quarter of 2000.

HTCL:

1.1 Hong Kong is among the world leaders in the application of mobile telephony and, to sustain this position, needs to move aggressively to keep pace with other countries in licensing spectrum for the introduction of 3G services. Prompt licensing of 3G spectrum:

- Removes uncertainty on license ownership, enabling capital to be raised efficiently
- Maintains Hong Kong's position as a global market leader and reinforces its position as the premier regional telecommunications hub
- Stimulates early investment in network infrastructure and, ultimately, revenue generation
- Encourages other countries in the region to adopt Hong Kong's policies on licensing, roaming and the selection and use of technology

1.2 Hence we strongly support the TA's proposed timescale of inviting applications in the last quarter of 2000, at the latest, in order to fulfill his expectation that commercial 3G services will be available in 2001.

1.3 The need for early license award is reinforced by the additional challenges that are inherent in developing a third generation mobile business:

- Being a completely new technology, 3G will require a longer period for network design, build-out and test, even assuming equipment suppliers' meet their delivery schedules.
- Because 3G will enable a much greater range of service diversity than traditional 2G services, a new set of business relationships and alignments will need to be negotiated between operators, content sources and services providers.

2 Standards Issues

3G Standards in Hong Kong - Single or Multi-standards

OFTA:

The TA intends to open to the prospective operators to use any IMT-2000 standards 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. The main consideration is that customers can easily switch from one network to another to obtain similar services and to maximize convenience in using roaming services without having to change the mobile terminals. The TA invites views from the industry on this proposal.

HTCL:

- 2.1 A key element of the regulatory framework developed by the TA is the focus on protecting the interests of the user in being able to switch from one network to another to obtain similar services. In its selection of the bands for the allocation of new spectrum for 3G services, the TA is effectively encouraging the adoption of the UTRA FDD version of the IMT-2000 standard for use in the new spectrum. This will guarantee that users' interests will be protected by ensuring terminal portability across different networks/ operators and supporting full compatibility for international roaming in Europe, Japan and other countries that adopt this standard, including the majority of Asian operators.
- 2.2 Hutchison also has the opinion that whichever technology is proposed by applicants, the candidate technology must provide wide-area geographical capability including rural-area coverage and high-speed mobility to the public.

3 Spectrum Issues

Availability of Spectrum for 3G Systems/Additional ITU IMT-2000 Spectrum Allocation

OFTA:

Taking into consideration that the spectrum in the 1885-1906.1 MHz band is currently in use for private cordless telephones and that a guard band is necessary between TDD and FDD systems of the 3G services, there will be 2 x 60 MHz paired spectrum and some 25 MHz to 29MHz unpaired spectrum available for terrestrial 3G mobile services in Hong Kong at this stage.

The TA will consult the industry again on the allocation of the IMT-2000 expansion bands for 3G services in Hong Kong when there is further development in the ITU.

HTCL:

- 3.1 The combination in Hong Kong of a high penetration of mobile phones and a high density of population already places great demands on the mobile operators to achieve maximum efficiency in the utilisation of spectrum. As this densely mobile-populated market migrates to 3G, the demands for "pedestrian" 384kbps and "in-building" 2Mbps services are likely to be proportionately greater than in other markets, resulting in above normal demand for bandwidth.
- 3.2 We therefore support the TA's viewpoint on the need to expand the 3G band as:
 - there will not be sufficient bandwidth for deploying high speed interactive multimedia services, which are highly anticipated to be demanded by the Hong Kong public.
 - there will be imminent need to expand bandwidth in order to cater for the expansion of 3G services within several years of rollout.

Services in 2G Spectrum

OFTA:

To allow existing 2G mobile operators to evolve their networks to 3G and to be in line with the adoption of the technology neutral policy discussed, the TA intends to open to the existing operators, whether they are successful or not in obtaining 3G spectrum, to use any IMT-2000 standards within their assigned 2G frequency bands for 3G mobile services when equipment is commercially available, subject to the TA being satisfied that the various technical standards are compatible with each other from the users' point of view and that the interest of existing 2G consumers is adequately safeguarded.

HTCL:

- 3.3 We agree with the TA's position that protects the interest of 2G customers by enabling an upgrade path to 3G through the introduction of 3G mobile services within the operators' assigned 2G frequency bands. It must always remain, however, at the operator's discretion as to which migration option the operator decides to promote to users.
- 3.4 For any 2G operators who wants to migrate their 2G system to 3G using their existing 2G spectrum, this should be allowed without adding any extra requirements. This will protect the interest of the customers, since all the functional requirements (e.g. high speed multimedia service) of IMT-2000 can be fulfilled as long as a member of the IMT-2000 "family of standards" is chosen. This is because the IMT-2000 "family of standards" concept has the target to allow roaming across the different members of the IMT-2000 standard. For those operators who choose 3G technology other than UTRA FDD to operate in 2G band, although roaming with other UTRA FDD networks may not be available at launch, this should not prevent the 2G operator from choosing such a standard.

Band Plan for 3G Services

OFTA:

The TA is of the view that Hong Kong should adopt a 3G band plan that is in compliance with the ITU IMT-2000 allocation. Any comment on this is issue is welcome.

HTCL:

- 3.5 We strongly support the TA's conclusion that Hong Kong should adopt a 3G band plan that is in compliance with the ITU IMT-2000 allocation and continue this policy in all aspects of mobile services. The benefits of this approach are considerable in terms of system commonality with other countries implementing IMT-2000 including Europe, Japan and the majority of Asian operators, enabling international roaming with common single band terminals and ensuring global economies of scale.
- 3.6 Because constraints on the available spectrum make spectrum efficiency a high priority for the TA, we recommend that no member of the IMT-2000 'family of standards' be selected which requires the use of guardbands within the allocated spectrum.

Individual Operator's Bandwidth Requirements

OFTA:

The TA is of the view that a new 3G operator will need 2 x 15 MHz paired spectrum in order to allow the implementation of three-layer hierarchical cell structure and the provision of a full range of 3G services including the high speed multimedia services at 2Mbps in an indoor environment. For incumbent 2G operators, the TA considers that less spectrum would be required because they can upgrade their 2G systems and use them to provide the macro layer. In this case, the minimum spectrum per existing operator is 2 x 10 MHz. If the foregoing spectrum allocation is adopted, between four to six licenses can be issued for 3G services, depending on the licensing model adopted. The TA invites comments from the industry on the proposed minimum 3G spectrum allocation to new and existing operators.

HTCL:

3.7 The TA itself has concluded that 2 x 15 MHz paired spectrum is required to deliver the quality of 3G services appropriate to the needs of Kong Kong's users and that 2 x 10MHz spectrum is inadequate:

- As stated in paragraphs 3.18 and 3.19 of its Consultative Paper dated 21 March, 2000:

"3.18 For an optimal 3G radio network employing UTRA FDD standard, the network should be planned using a three-layer hierarchical cell structure using macro, micro and pico cells A macro layer is necessary to provide the wide area coverage and is also used for mobile users in fast moving vehicles. The micro cells are used at street level for outdoor coverage to provide extra capacity where macro cells could not cope. Pico cells would be deployed mainly indoors, where there is a demand for high data rate (2 Mbps) services such as laptops networking or multimedia conferencing."

And

"TA is of the view that a (new) 3G operator will need 2x15 MHz paired spectrum in order to allow the implementation of three-layer hierarchical cell structure and the provision of full range of 3G services including the high speed multimedia services at 2 Mbps in an indoor environment."

- As stated in the conclusion of OFTA IMT-2000 Focus Group report dated September 1999:

"A minimum 2 x 15 MHz FDD plus 5 MHz TDD spectrum allocation per operator is preferred;"

- As concluded in Annex 7 of that OFTA IMT-2000 Focus Group report:

The limitation of 2 x 10 MHz paired spectrum is: "Very limited capability in support high-speed multi-media service" due to a system capacity of "1.6 - 4 Mbps per cell". This compares at 2 x 15 MHz paired spectrum with: "Support for high-speed data and voice services simultaneously" and system capacity of "2.4 - 6 Mbps per cell".

- 3.8 The TA has however expressed an opinion that an allocation of only 2 x 10MHz paired should be adequate for incumbents. We do not agree with this conclusion and offer the following arguments to refute it:

SCENARIO ONE: If the TA's statement "upgrade of 2G system" means to use GPRS or EDGE 2.5G technology to provide the macro layer for 3G customers, we believe this is not a feasible solution:

- 3.9 While the incumbent may indeed provide wide area packet coverage on its 2G spectrum via GPRS or similar 2.5G service, the performance will be inferior to 3G services, as described in paragraphs 3.10 to 3.13 below.
- 3.10 Firstly, from an overall system capacity point of view, to upgrade the 2G network and use its capacity for the 3G macro layer will cause the already heavily loaded 2G network to become even more loaded. It is therefore concluded that the capacity of a "macro layer" provided by the upgraded 2G network would be much less than in a 2 x 5MHz 3G band allocation. The overall data throughput and number of customers that could be supported would be much smaller. Subsequently, the voice blocking rate will be much increased and data throughput per customer will be much reduced for 2G customers and also for 3G customers.
- 3.11 From a throughput-per-call point of view, most GPRS vendors are only supporting the CS1 & CS2 coding scheme. Even with CS2 and 8 timeslots concatenation, GPRS can only offer a throughput of 107.2kbps (8x13.4). The requirement of IMT-2000 for the macro layer is a minimum of 144kbps with multiple users. Moreover, according to UMTS Report No. 5 – "Minimum spectrum demand per public terrestrial UMTS operator in the initial phase", the maximum available bit rate for the macro layer is 384kbps, which is much higher than is possible with GPRS. In fact, according to the same report, the maximum available data rate for a carrier in FDD-mode (2 x 5 MHz) is 2 Mbps (uplink/downlink) capacity for low mobility (pedestrian, office and home). This throughput could be possible in the macro-layer for low mobility user in certain time (e.g. at night the traffic load is light and hence the interference is low) and in certain remote areas (where the interference is already low), which is higher than even EDGE can offer. On the other hand, relying on the 2G system to provide macro layer, due to the inferior throughput, there would be "low data rate blind spots" while the connection is gone from 3G system to 2G system.
- 3.12 In order to enable the 2G network for the macro layer, the incumbent operator would have no choice but to upgrade its 2G network to either support the faster CS3/CS4 coding scheme or introduce EDGE. Both require significant extra hardware changes. Since any of these new technologies are inferior to UTRA FDD in providing the macro layer, they are not an acceptable solution.
- 3.13 In the latest standard of 3GPP, the specification for dual mode (2G <->3G) handover is not mature. For example, the specification for inter-system handover of circuit switched calls from a 2G system to a 3G system is still being written and is not finalised yet. Therefore high-speed interactive multimedia services such as video conferencing will be jeopardised. Usually it would take about one year before a commercial product is available after a completed standard is ready. The incumbent therefore could not provide 3 layers at the date of launch in 2001, significantly reducing its competitive position and slowing down the development of high speed data applications in Hong Kong.

SCENARIO TWO: If the TA's statement "upgrade of 2G system" means deploying UTRA FDD technology using 2G spectrum, we believe this is not a possible solution:

- 3.14 Such an approach placing the 3G macro layer in the 2G spectrum bands (either 900 or 1800MHz) would be unique to incumbent operators in Hong Kong, with the result that compatibility with other 3G networks and terminals (including new entrants in Hong Kong) would be lost. To our knowledge, no other operators would be implementing UTRA FDD across a split 2G/3G spectrum allocation nor is any manufacturer planning to make infrastructure or terminals to this specification.
- 3.15 The current 2G spectrum in Hong Kong is already heavily loaded. It is therefore likely to be a long time before they could spare a 2 x 5 MHz spectrum slot for 3G service. Moreover, the complicated migration process would reduce the service sets available to the 3G customers in the 2 x 10 MHz 3G band during the migration period.
- 3.16 If visitors do not have the specific terminal capable of operating on 3G services across both 2G and 3G spectrum, international roaming would be severely hindered.

Without the macro layer using 3G technology and in all the above scenarios, Hong Kong will not achieve leadership in the information age:

- 3.17 In BOTH SCENARIOS, depending on the availability of different types of 3G terminals, including single band, dual band (3G service in 3G and 2G band) and dual mode terminals (3G service in 3G band and 2G service in 2G band), customers of the incumbent 2G operator would need to upgrade and change their terminal a number of times before they could enjoy the same services as could be delivered by a new entrant operating in 2 x 15 MHz of 3G spectrum. This would be both frustrating to the users and commercially unattractive to the operator.
- 3.18 In Scenario ONE, it is most probable that manufacturers will initially produce dual mode terminal without 2G/3G handover function in the first commercial release. The incumbent operator will therefore not be able to provide three layers at launch, thereby slowing down the development of high-speed data applications in Hong Kong. Note that HANDOVER is a necessary feature without which the service is not acceptable to customers, but indications from terminal vendors suggest that GSM(900/1800)/GPRS/UMTS handsets will not become available until the first half of 2002.
- 3.19 In Scenario ONE, the roadmap of network equipment and dual mode terminals supporting EDGE/3G is not certain, with dates for dual mode terminal availability quoted as far out as mid-2003. The incumbent operator will therefore not be able to provide three layers at launch and would therefore slow down the development of high-speed data applications in Hong Kong.
- 3.20 In Scenario ONE, due to the inferiority of GPRS and EDGE type of technology as compared to UTRA FDD for the macro layer, this solution will slow down the development of high-speed data applications in Hong Kong.
- 3.21 In Scenario TWO, as agreed by the TA in Paragraph 3.7 of the Consultative Paper, the availability of 3G network equipment operating in the 2G band, as well as the availability of 3G dual band terminals, is very uncertain. Therefore the incumbent would not be able to provide the three layers at launch and therefore would slow down the development of high-speed data applications in Hong Kong.

- 3.22 The reality is that if incumbents were only granted a 2 x 10 MHz paired allocation (as is the case in some European markets), they could not implement the macro layer in UTRA FDD, thereby severely constraining their ability to provide coverage comparable with that expected by GSM customer today. According to UMTS Forum Report No.5 - "Minimum spectrum demand per public terrestrial UMTS operator in the initial phase", the negative impacts of operating without a macro-layer would include:
- a) it will be virtually impossible to cater for fast moving mobiles - the end-user would likely experience dropped calls when travelling at highway speeds;
 - b) it will be very complicated and expensive to achieve seamless coverage - the network cost will be very high to achieve it and this cost will eventually be paid by the end-user.

If, on the other hand, the incumbents choose to implement the 2 x 10 MHz paired allocation for macro and micro layers, they could not implement the pico layer, thereby severely constraining their ability to deliver 2 Mbps in-building service. The corresponding negative impact would include:

- c) the capacity may not be sufficient to carry forecast traffic due to deployment of the macro and micro layers, which is a combination with less spectral efficiency;
- d) there is no pico layer to offer the 2 Mbps service – the end-user cannot enjoy high-speed multimedia service.

Re-emphasis of the absolute market-specific need for 3 layers of "pure" 3G technology, SPECIFICALLY in Hong Kong:

- 3.23 As demonstration of the differences between the mobile environments of Hong Kong and Europe, we have sought to compare the density of 2G subscriber traffic in Hong Kong with traffic levels in Europe. In the table below, we have listed the traffic per square kilometer on HTCL's network in Hong Kong's five busiest Districts.

DISTRICT	Land Area in Km ²	Traffic Density (BBH Erlang/Km ²)	Traffic Density (Daily Erlang/Km ²)
Central and Western	12.1	104.3	962.6
Kowloon City and Hunghom	10.2	105.7	1125.3
Sham Shui Po	8.9	92.9	930.9
Wan Chai and Causeway Bay	9.7	116.8	1336.8
Yau Tsim Mong	7.0	290.1	3228.4

- 3.24 Calculations by PA Consulting Group, prepared at our request, suggest that the highest of these levels of peak busy hour traffic is only matched in Europe in much more concentrated European "hot spots", such as a terminal building at Heathrow Airport. Furthermore, this traffic capacity in Hong Kong is achieved in 2 x 7.5 MHz of GSM 900 band and 2 x 10 MHz of spectrum in the GSM 1800 band, compared with the 2 x 20 to 2 x 30 MHz GSM or PCN spectrum that operators are granted in most European countries.

- 3.25 These higher subscriber traffic densities in Hong Kong, plus the expectations we have already established in Hong Kong for seamless coverage in buildings, transit systems and tunnels, further support our contention that 2 x 15 MHz paired spectrum allocation is required to deliver the full range of 3G services. The rationale that a subset of European regulators and operators have convinced themselves that 2 x 10 MHz is adequate for a constrained (sub)set of 3G services in their markets is insufficient justification to reach the same conclusion for Hong Kong.

Need for wider bandwidth in preparation for technology evolution:

- 3.26 A more appropriate market for comparison of market needs might be Japan, which has greater similarity to Hong Kong in terms of population density and mobile subscriber usage patterns, and has a more common vision for the development of mobile multimedia services. Analysis provided by our partner NTT DoCoMo makes a compelling case for the allocation of 2 x 20 MHz paired spectrum to each operator.
- 3.27 It is our view that a higher bandwidth allocation per operator will enable technology evolution. By combining several 5 MHz carriers into one 15 MHz-carrier or 20 MHz-carrier, the overall capacity can be increased tremendously resulting in a much higher capacity per society, which can then provide much higher speed multimedia communication. For a 20 MHz carrier, it can guarantee the 2 Mbps throughput of data service with multiple users in both indoor and outdoor environments, which is not possible in current technology.
- 3.28 In a report from the Telecommunication Technology Council (TTC) of Japan's MPT, there is a comparison between the spectral efficiency of using 2 x 5 MHz and 2 x 20 MHz for WCDMA (i.e. UTRA FDD) technology. In the RTT proposal from ARIB to the ITU, there is a spectral efficiency estimation for 2 x 5 MHz using computer simulation; the TTC report uses the same simulation model and assumptions for comparison between 2 x 5 MHz and 2 x 20 MHz. The comparison covers different radio environments and conditions. It concludes that:
- Using 5 MHz, it is possible to transmit 2 Mbps in office and hall environments for circuit and packet switched data services.
 - However, when the number of users increases, the throughput of the cell decreases dramatically to a value much lower than 2 Mbps, which therefore cannot guarantee a high data rate offer to customers.
 - When a 20 MHz carrier is used, the spectral efficiency can be increased up to 8.7 times better than the case of 5 MHz, especially in a poor radio environment with external interference, which is inevitable in most urban environments. From a system capacity point of view, a 20 MHz operator has therefore a much higher capacity than would an operator with four 5 MHz carriers.
 - The 20 MHz carrier can therefore guarantee a 2 Mbps service available to a customer and even with multiple users, which is not possible with even four 5 MHz carriers, since one handset can only use one carrier at a time.
 - The 20 MHz carrier can therefore also provide 2 Mbps data services even in an outdoor environment.

For details, please refer to TTC's final report on:

"Technical Requirement for Next Generation Mobile Communication System" dated September 27, 1999, section 3.2.3.1 and Reference information section 7.

- 3.29 The TTC results show that 2 x 20 MHz is best. If, however, 2 x 20 MHz is not available in Hong Kong, it is our view that 2 x 15 MHz should be the minimum bandwidth per operator.

Decisions of overseas regulators support the need for greater bandwidth:

- 3.30 In support of our conclusion for 2 x 15 MHz paired spectrum allocations, we would direct the TA's attention to the conclusion of the Swedish regulator, Post & Telestyrelsen, regards granting four 2 x 15 MHz licenses or five variable allocation 3G licenses. In its press release dated 19 April 2000 (<http://www.pts.se/infoeng/umts-pressapril.htm>), PTS states the reasoning behind its decision to grant only the four larger allocations: "Having four UMTS licenses means that the four operators who obtain licenses can have access to a sufficient frequency spectrum to allow them to provide comprehensive radio transmitted broadband services."

Conclusion on the need for 2 x 15 MHz:

- 3.31 HTCL therefore opposes the TA's proposal of a reduced 2 x 10 MHz paired (with 5 MHz unpaired assigned at a later stage) spectrum allocation for incumbents. To enable equal competition in the market and to deliver the services expected by users in Hong Kong, all operators must have access to a minimum allocation of 2 x 15 MHz paired 3G spectrum.

Allocation of TDD spectrum

OFTA:

The TA therefore considers that there may be no immediate need to make a decision on the allocation of the TDD spectrum. However the TA will reserve the TDD spectrum in the 3G bands for use by the licensed 3G operators and will further consult these operators when it is timely to allocate this spectrum. The TA invites views from the industry on the proposed allocation of TDD spectrum.

HTCL:

- 3.32 We agree with the TA's position, provided that the right to a 5 MHz allocation at some future date is explicitly incorporated in the 3G license award. This certainty will enable operators to actively encourage terminal/infrastructure vendors to develop appropriate solutions utilising the asymmetric capabilities of TDD technology to stimulate the delivery of new and innovative services to the Hong Kong public.

4 Licensing Issues

Need for New Entrant

OFTA:

In the view that 3G technologies may provide scope for innovative service developments and, as a new entrant would not be constrained by any legacy network elements, it would have more flexibility in developing its network for new service applications and providing new

input to the benefit of industry and consumers. The TA therefore considers that the introduction of new entrants to the 3G market will be beneficial to market developments and to consumers.

HTCL:

- 4.1 Hutchison is a strong proponent of the value that new entrants can contribute in helping to develop new markets, as demonstrated by its success in the UK mobile market with the launch of Orange as the fourth 2G operator.
- 4.2 Having stated this bias as to the value of new entrants, however, it is also necessary to consider the unique competitive structure of Hong Kong's mobile market. Unlike any other regulator considering the process by which it will allocate 3G spectrum, OFTA has to address the issue that Hong Kong has more incumbent 2G operators than there are 3G licences feasible. Those other regulators, if they determine that the introduction of new competition is beneficial to the public interest, have the option of proposing an N+1 (or greater) process or related variant, where N is the number of incumbent operators. Underlying this structure is the implicit expectation that the incumbents will "bid to win at any cost" to remain a viable mobile competitor, but still ensuring that at least one new entrant is introduced to that country's mobile marketplace. This expectation has been fulfilled in the first major country operating a spectrum auction, the UK.
- 4.3 In Hong Kong, where N equals 6, it is not feasible to allocate N+1 3G licenses since there is insufficient spectrum available. In this scenario where there must be non-winning incumbents, it is not equitable to give any participant, incumbent or new entrant, exceptional rights to a specific proportion of the limited spectrum. Hence, we conclude that all participants should be treated equally, with new entrants actively welcomed to participate either in alliance with or independently of incumbent operators for an identical allocation.

Incumbent Operators

OFTA:

The TA is therefore of the preliminary view that there are benefits in allowing incumbent operators to bid for the 3G services, but they should not be given any priority over new entrants in the bidding process. Views and comments are sought on this issue.

HTCL:

- 4.4 In the reverse argument to that presented for equal access for new entrants, we would similarly make the case that incumbent 2G operators be allowed to bid on an equal basis with new entrants, with no priority or differential in quantity of spectrum given to any party.

Licensing Options

OFTA:

The TA has not yet formed a view on the preference for any one of the above licensing options and would like to seek comments from the industry prior to making a final decision.

HTCL:

- 4.5 As stated above, we favour equal treatment for all applicants and we have already presented the case that the minimum viable allocation for delivering the full range of 3G services in Hong Kong is 2 x 15 MHz paired. Hence, the only proposed option we can support is Option 1 - four licenses of 2 x 15 MHz paired, with one 5 MHz unpaired reserved for each licensee.
- 4.6 To counter the TA's identified demerit that existing operators could enjoy some inherent advantages in their proposal that might favour them over new entrants in the selection process, there are a number of factors which provide redress:
- Since there are more incumbents than available 3G licenses, new entrants have the option of allying with an incumbent operator to eliminate this potential weakness.
 - There is little evidence from experience in other markets that new entrants do indeed face serious disadvantage. Indeed, anecdotal experience of executing rapid network build-outs in other countries suggests that the incumbents' need to manage integration of the new network in parallel with legacy systems and installations results in different but similarly challenging problems.
 - Among possible participants in new entrant consortia, there are a number of Hong Kong based companies whose contribution to any 3G partnership would be either backbone network or site ownership, again obviating much of the advantage that the incumbents' legacy network might provide.
- 4.7 Analysis of the global IMT-2000 Licensing Status dated May 5, 2000, compiled by the UMTS Forum (<http://www.umts-forum.org/licensing.html>) suggests that regulators' decisions on spectrum allocation and number of licenses is influenced by the licensing process adopted. As illustrated in the table below, many variants in spectrum allocation and number of licenses are being adopted.

Number of 3G licenses	Spectrum allocation	Country
3	2 x 20 MHz paired	Japan
4	2 x 15 MHz paired, 5 MHz unpaired	Belgium, Denmark, Finland, France, Norway, Portugal, Spain, Sweden, Switzerland, New Zealand
5	Various combinations 2 x 10 MHz paired, 5 MHz unpaired	UK Italy
4-6	Minimum 2 x 10 MHz paired Maximum 2 x 15 MHz paired Additional 5 MHz blocks in 2 nd round	Germany, Austria

- 4.8 When commercial pressures are introduced into the process by the decision to conduct an auction, the number of licenses available tends to increase, with the average spectrum allocation typically reduced, as shown in the table below. In Hong Kong, the auction process must be structured such that each license offers the

minimum spectrum allocation of 2 x 15 MHz required to provision the full range of 3G services appropriate to the needs of this market, i.e. four licenses.

Licensing process	Number of 3G licenses	Spectrum allocation	Country
Evaluation on Merit (or Beauty Contest)	3 or 4	2 x 15 MHz unpaired (2 x 20 MHz in Japan), 5 MHz unpaired	Japan, Denmark, Finland, France, Norway, Portugal, Spain, Sweden
Auction	4	2 x 15 MHz paired, 5 MHz paired.	Switzerland, New Zealand
Auction	5	Various combinations including 2 x 10 MHz paired. 2 x 10 MHz paired, 5 MHz unpaired	UK Italy
Auction	4 to 6	Minimum 2 x 10 MHz Maximum 2 x 15 MHz 5 MHz blocks in 2 nd round	Germany, Austria

- 4.9 Further support for limiting the number of 3G licenses to four comes from direct experience of managing network deployment in Hong Kong. Negotiating antenna locations is already extremely challenging, road, pedestrian and MTR tunnel sites are already highly congested and equipment rooms full.

Operator Selection Arrangement

OFTA:

The TA invites comments from industry on his intention to select 3G licensees by evaluation based on merit.

HTCL:

- 4.10 As a global company, Hutchison's primary interest in all bid situations is that we have a fair and equal opportunity to compete to win a license and that, once granted, the regulatory framework allows us to focus on operating our business in the most effective manner.
- 4.11 The stunning success of the UK's 3G spectrum auction in generating higher-than-expected contributions to the British Government's Treasury (£23 billion versus initial estimates in the low single billions) has given a significant stimulus to support for the auction approach.
- 4.12 We do, however, recognize that there are arguments on both sides the "auction" and the "evaluation on merit" license allocation processes and that, with both, there are significant implications for the future role of the TA in how they are implemented and monitored.

The Case for Auctions

- 4.13 To quote Peter Crampton, Professor of Economics at the University of Maryland and a leading advisor to the FCC, speaking before the US Senate Budget Committee in February 2000 (www.crampton.umd.edu): "The FCC auctions have shown that using an auction to allocate scarce resources is far superior to the prior methods: comparative hearings and lotteries. With a well-designed auction, resources are allocated efficiently to the parties that value them most, and the Treasury obtains much-needed revenues in the process."
- 4.14 There is the argument that auctions offer early revenue to the government but that license winners will seek to recoup the license payment in higher prices.
- 4.15 In response, the architect of the UK's auction, Professor Ken Binmore of University College London, has stated that analysts who fear high license bids for 3G will lead to high service pricing have made a "naïve" assumption that using cost-plus pricing methods means somehow operators can load license costs into future charges. He concludes: "If you (operators) do that you will lose all your business to the operator who offers the service for a lower price than yours."
- 4.16 Underlying the selection of the auction process in the UK, the USA, Australia and elsewhere is the recognition by regulators of the benefit of an open competitive framework for managing the evolving internet-oriented telecommunications marketplace. For example, the UK's Ofcom has recently published a paper explaining its new strategy (<http://www.ofcom.gov.uk/about/strat100.htm>) which includes significant changes of emphasis towards a "lighter touch" form of regulation combined with heavier penalties for anti-competitive behaviour. The key philosophies underlying the new strategy are summarized (statements highlighted in **bold** type by HTCL for emphasis) as:

*I. Regulate only where it is likely to bring benefit to consumers. **Keep regulation to the minimum necessary to obtain appropriate outcomes.***

*II. Where competition is increasing but not yet effective, **promotion of competition is acceptable so long as***

- competition is sustainable without regulation in the longer term and

*- **it does not create disincentives for new entrants or incumbents to invest in infrastructure or to innovate in the provision of new services.***

Regulation to promote competition/protect consumers should become progressively 'lighter touch' as the market gets near to effective competition.

*III. **Cease to promote competition when there is effective competition.** Assessment of effective competition to be based on standard competition analysis that takes account of benefits obtained by consumers.*

IV. Encourage greater awareness on the part of consumers so they are able to make competition effective and rely less on regulation. Rely on standard consumer legislation wherever this is sufficient.

*V. **Encourage industry to meet the needs of consumers rather than to rely on regulation.***

VI. Where competition cannot provide agreed services to all at affordable prices, regulate to ensure there is such provision in a way that minimises distorting effects. Geographically averaged prices should be used only for supply of basic service to ensure network access by all.

VII. Control of prices should be limited to those areas where competition is ineffective now and in prospect (4 years+).

VIII. Where competition is not in prospect or the market, of itself, won't meet consumer needs, regulate to replicate efficient outcomes subject to not undermining incentives to innovate. Ensure resources are managed efficiently but seek market solutions wherever feasible.

IX. Encourage industry, wherever feasible, to regulate itself in those areas where a common approach is necessary to meet consumer needs ie either to provide service or for the development of competition. Any OFTEL role to be a fallback one.

X. Rely on competition legislation to control anti-competitive behaviour wherever possible: licence conditions may be used to promote competition where competition legislation is inappropriate or where there is an abuse of market power short of dominance: where licence conditions are used be explicit why and for what purpose.

- 4.17 Acknowledging similar regulatory challenges from convergence, the Info-communications Development Authority (IDA) of Singapore is in the process of requesting comments on its "Code of Practice for Competition in the Provision of Telecommunications Services" (<http://www.ida.gov.sg>). The proposed code "places significant reliance on market forces. Where effective competition exists, Licensees would be subject to minimal regulatory requirements."
- 4.18 It is our belief that, thanks to the TA's policies to date, the Hong Kong mobile services market has "effective competition." It is therefore now appropriate that the TA move to a similar, less interventionist, "lighter touch" form of regulation for the licensing of 3G.
- 4.19 Such "lighter touch" licensing focuses on specifying coverage requirements in a certain timeframe and does not seek to intervene in the post-license competitive environment through control of prices and other elements of performance. In the UK, for example, 3G licenses only specify 80% population coverage by the end of 2007, while other countries have chosen to specify various intermediate coverage requirements - Germany calls for 25% of population by end-2003 and 50% by end-2005, with the option to increase to a 70% obligation at a later date. The on-going role of the regulator after license award is to monitor for abuses of competitive power and to intervene only when necessary.
- 4.20 This transition to a "lighter touch" regulatory framework must be an integral element of the auction process of selecting operators.
- 4.21 Finally, licenses should be extended from the 10 years typically awarded by the TA for mobile services to 20 years, as granted by Oftel in the UK for 3G licenses, to enable recovery of the initial investment.

The Challenges of "Evaluation on Merit"

- 4.22 As a corporate citizen of Hong Kong, Hutchison has considered which option better fulfils the stated objectives of the TA - to best serve the interests of Hong Kong's users. The TA has argued in the body of its Consultative Paper that these interests are best served by continuing the "well established approach to select 3G operators by evaluation based on merit."
- 4.23 Regulators in some other Asian markets including Japan, as well as a number of European regulatory bodies, have also concluded that the "evaluation on merit"

(described as "beauty contests" by many) process is appropriate to their countries needs. However, unlike Hong Kong with multiple incumbents, seemingly implicit in their decision process is the expectation: all incumbent operators can be successful in acquiring 3G licenses.

- 4.24 While the precise nature of the "evaluation on merit" process in Hong Kong will be the subject of further consultation by the TA in July, initial statements indicate he is considering a "reverse auction" process, with the operator bidding the lowest service fees would gain the most credit. Overall, operators would bid based on four criteria: size of investment, service fee, availability of service and the size of a performance bond. These criteria are intended to serve as an objective measurement of the relative merit of bids.
- 4.25 The criteria and "reverse auction" proposed by the TA giving strong weighting to the lowest service fees are more reflective of the "heavier touch" (or as described in a recent South China Morning Post Monitor column, a "command economy") style of regulation traditionally practiced in Hong Kong. We strongly question whether these criteria are appropriate to the fast-evolving internet-oriented world of 3G mobile services.
- 4.26 Specifically, operators will be developing business proposals with limited precision as to what services 3G users will demand or the pricing mechanisms by which they will generate a return on their investment. Unlike 2G voice services, there is no standard "product" based on price per minute of usage. In 3G, new forms of revenue generation will be available to the operator such as advertising, channel "placement" fees, service sponsorship, content-based pricing, etc.
- 4.27 As example of this challenge, a recent report by telecom industry analysts BWCS forecasts that, by 2005, only a third of operators' revenues will come from voice calls and subscriptions, down from between 95 and 100 percent today. The other two thirds are forecast to come from other sources including Internet access charges, advertising, e-commerce transaction fees, and artificial intelligence-based "virtual assistant" services.
- 4.28 Such variations in "pricing" models and quality of content in each company's business model will make pre-license comparison unreliable, while post-license-award performance monitoring will be unworkable.
- 4.29 The emphasis on service pricing in the selection criteria will also tend to induce operators to compromise service quality in order to achieve the lowest, most competitive pricing levels. Such an outcome threatens to discourage development of innovative services and seriously undermine the position of Hong Kong as one of the advanced and premier markets in the world in terms of the development and application of mobile communications.
- 4.30 We conclude, therefore, that the TA's "evaluation on merit" process does not fulfill the standard for equal opportunity in selection, while the post-license performance monitoring will act as a constraint on the flexibility of the market's evolution.

HTCL's Conclusions on the Operator Selection Arrangements:

- 4.31 Whichever process is ultimately selected by the TA, we intend to compete vigorously with the intent of winning a 3G license in Hong Kong
- 4.32 While Hutchison understands that the TA has stated a current leaning toward the "evaluation on merit" process, we conclude that the "auction" option is more appropriate to the unique competitive environment of Hong Kong. It provides equal opportunity for all bidders and Hong Kong's Treasury benefits. Spectrum resources are allocated efficiently to the parties that value them most.
- 4.33 Selection of this option must be predicated on the TA's support of a "lighter touch" philosophy of regulation where competition is the "mechanism" that regulates individual operators' behaviour and the extension of the license award period to 20 years.

5 Regulatory Issues

Similar regulatory framework for mobile telephone services applies to 3G?

OFTA:

The 3G mobile systems have the capability of providing broadband multimedia services. It is expected that the scope of services that will be provided by 3G platforms will be substantially more extensive than that of the 2G platform. As the operation and the scope of the 3G services are significantly different, the TA would like to seek the views of the industry on whether the 3G services should be regulated under a similar regulatory framework as that for the mobile telephone services at present. In particular, the TA invites views on whether any safeguarding measures should be introduced or strengthened to preserve effective competition on the 3G market.

HTCL:

- 5.1 Since a proportion of the traffic on 3G networks will be voice and some circuit switched data, it is necessary that 3G services be regulated under a similar framework to that for 2G services to ensure the same structure for interconnection to the PSTN.
- 5.2 The remainder of the traffic will be IP-based, which has very simple interconnection that does not require regulation as for W-FTNS. Like ISPs, 3G operators should be free to interconnect by the route(s) of their choice.
- 5.3 Under the "lighter touch" regulatory framework espoused for 3G in paragraphs 4.14 to 4.17 of this document, no explicit "safeguarding measures" would need to be introduced or strengthened - the forces of competition are sufficient, under the on-going oversight of the TA.

Timing to Review the Current Framework in View of Fixed-mobile Convergence?

OFTA:

The TA would like to seek views and comments from the industry on the necessity to maintain a regulatory distinction between the fixed services and the mobile services and whether there is a need to maintain separate forms of licenses for the FTNS and mobile telephone services.

HTCL:

- 5.4 HTCL has recently provided its opinions on this issue in response to OFTA's "Industry Consultation Paper - Review of Methodologies for Calculation of Interconnection Charges for Value-Added Services and Public Mobile Radiotelephone Services and Local Access Charge."
- 5.5 To restate our conclusion: "In view of the (above) changes in the market and the impending and irresistible global trend of treating mobile and fixed operators on an equal footing in respect of interconnection arrangements, we seriously urge OFTA to accord mobile operators with "carrier" status and apply carrier-to-carrier charging principles in mobile-fixed interconnection so as to ensure that the originating operator will pay the terminating operator for the interconnection charges."

Domestic Roaming between 2G and 3G Networks

OFTA:

The TA invites views from the industry on whether such an obligation should be imposed on the 2G network operators if they are successful in obtaining 3G licenses and, if so, whether any such obligation should be a short-term one and the applicable charging principles.

HTCL:

- 5.6 The TA considered a similar issue of mandated domestic roaming in its 1998 Consultative Paper on "Dual-Band Operation and Domestic Roaming for Public Radiotelephone Services in the 800/900 MHz Band and Personal Communications Services in the 1.8GHz Band." In response to the case argued by incumbents against mandated roaming, in his Statement dated 28 August 1998, the TA decided "that he would not mandate the provision of domestic roaming at this time. The provision of domestic roaming will be the subject of bilateral agreement between mobile operators." We would argue for the same conclusion in the case of 2G to 3G roaming.
- 5.7 The uniqueness of Hong Kong's competitiveness in incumbent 2G operators ensures that a commercial incentive will enable a fair competitive environment in the event that a new entrant wins a 3G license. Assuming that a maximum of four 3G licenses are awarded, the new entrant will be in the position to negotiate a mutually beneficial roaming agreement with one or more 2G incumbents who have not won 3G spectrum. Thus we conclude that there is no requirement for the TA to obligate general roaming by 3G users onto incumbent operators' 2G networks.

The TA invites views from the industry on whether such a roaming arrangement from 2G networks to 3G networks should be implemented. The TA would also seek views on the technical and commercial implications of such a roaming arrangement and whether there are technical and operational difficulties in roaming from 2G to 3G networks.

HTCL:

- 5.8 Similarly, if a new 3G-only entrant wins a 3G spectrum allocation, it would presumably be in their commercial interest to negotiate roaming agreements with incumbent 2G operators who have not won a 3G license in order to stimulate traffic on their new, lightly-loaded network. So, as above, there is no requirement for the TA to obligate general roaming by 2G users onto 3G networks.
- 5.9 A different perspective on this issue from the UK's Oftel, discussing access to second generation mobile networks for new entrant third generation mobile operators. In a consultative document issued by the Director General of Telecommunications dated May 1999, Oftel reaches the same conclusion:
- "2.16 Some of the existing 2G operators argued that a 2G operator who is unsuccessful in the auction should be able to roam onto a 3G network. OFTEL believes that this is not appropriate because all the 2G operators are free to enter the auction and bid for 3G spectrum. There are no existing 3G networks. Therefore 2G to 3G roaming is not needed to address any disadvantages which the incumbents face in entering the auction. Moreover mandatory 2G to 3G roaming would seem to present a serious disincentive to new entrants to enter the auction. However, there is no regulatory constraint on such agreements being reached commercially." (<http://www.oftel.gov.uk/licensing/2g3g0599.htm>).
- 5.10 A final point on 3G roaming: in many larger countries where the build-out of 3G coverage is likely to vary between operators, regulators are specifying in the 3G license an obligation for national roaming between 3G networks under various mandatory or voluntary structures. Such roaming should not be required in Hong Kong due to its high density and small geographic area, making the prompt achievement of reasonable coverage feasible for all license winners. This has been demonstrated by the rapid rollout of the PCS networks after the PCS licenses were awarded.

Separation of Service Provision from Network Operation

OFTA:

The TA invites views and comments from the industry on the concept of separating service provision from network operation and whether it should be implemented in the 3G mobile services.

HTCL:

- 5.11 Experience in other markets of seeking to mandate the separation of service provision from network operation indicates that this is an artificial construct that does not stand the longer-term test of commercial reality. As Europe has clearly demonstrated in the evolution of its cellular industry, once mandatory separation of service provision from network operation was relaxed, consolidation lead to the extinction of all but the most commercially-adept service providers.
- 5.12 HTCL does see value in the concept of resellers (service providers) or Mobile Virtual Network Operators (MVNOs) when defined through commercial negotiation to achieve mutual benefit. Examples of such commercial relationships include European service providers such as Debitel in Germany and Virgin's MVNO agreement for 2G services with One2One in the UK.
- 5.13 In reviewing other regulators' consideration of the MVNO concept, the basic argument put forward for introducing MVNO's is to ensure effective competition that will stimulate a high degree of innovation and offering of new services, lower prices on international roaming and termination in mobile networks. The implication of such effective competition would be lower end-user prices and more advanced service offerings. These positive effects must be judged against the possible negative effects of reduced incentives for investment both in existing GSM networks and future roll-out of e.g. 3G/UMTS.
- 5.14 Using responses to the Norwegian regulator's consultative paper as an example, MVNO's are certainly perceived to be better equipped to introduce new services than Service Providers since MVNO's can produce their own service on their own SIM-cards. But, to ensure that MVNO's do not get to be freeloaders on the operator's network investments, the costs of access would have to be based on the actual cost and Network Providers will need mechanisms that will reduce the uncertainty regarding MVNO's actual demand for capacity. This problem may seem quite simple when there is a lot of free capacity, however the uncertainty associated with future demand if MVNO's are allowed access was considered substantial enough that a successful implementation of MVNO's was not seen as probable. Furthermore, it was considered likely that introduction of MVNO's would reduce investments in new networks. On review of these arguments, the regulator rejected mandating the separation of service provision and network operation.
- 5.15 HTCL's conclusions from analysis of requests for MVNO relationships in the Hong Kong market also demonstrate that negotiating a mutually attractive arrangement is extremely challenging. Hence, we conclude that mandatory separation of service provision from network operation is not viable; such relationships can only be established through commercial negotiation at the discretion of individual operators.

Mobile Number Portability

OFTA:

The TA intends to set out MNP as a mandatory requirement in the licensing conditions of the forthcoming licenses.

HTCL:

- 5.16 MNP has encouraged competition in Hong Kong, and the existing MNP mechanism should be extensible to 3G.
- 5.17 However, 3G is a completely new network, with intended coverage over the whole Hong Kong territory. Implementation of four 3G networks in Hong Kong will require repeating the whole process already done for 2G MNP. This will include GN number allocation, identification of MNP service provider, Hong Kong territory and industry wide testing, implementation of MNP service provider's system and integration of GN, AD, CTS, and the 3G network.
- 5.18 Mandating 3G operators to provide MNP at launch will therefore inevitably prolong the rollout of 3G, which is not beneficial to Hong Kong society.
- 5.19 Hutchison therefore is of the view that MNP should be mandated in the license, but the date of implementation should be the subject of industry discussion and development of a plan for industry-wide implementation.

Numbering Requirement

OFTA:

The TA intends to allocate the leading digit "6" primarily for 3G services.

HTCL:

- 5.20 To the voice user dialling a call there should be no difference between 2G and 3G. We therefore recommend continuation of the current policy of using the leading digit "9" for mobile numbers (and this is required for MNP as users migrate from 2G to 3G) and welcome the TA's allocation of leading digit "6" for future expansion.