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22 May, 2000

Office of the Telecommunications Authority

29/F, Wu Chung House
213 Queen's Road East
Wan Chai
Hong Kong

Attn : Senior Telecommunications Controller
(Competitive Services)

Dear Sir/Madam

Re : **CCT Telecom Holdings Ltd on the Public Consultation on 3G licensing in Hongkong**

It has been our pleasure by CCT Telecom Holdings Ltd to present our views in response to the public consultation on 3G licensing in Hongkong.

We hope this submission will help OFTA to identify in a better sense, the needs and viewpoints of the current and potential 3G players in Hongkong, especially the ones held by CCT. We do also exhibit a serious interest in any of the future 3G activities here and abroad.

We appreciate for your kind attention, and please feel free to contact the undersigned on any questions that you may have.

Thank you and regards,

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Managing Director

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CCT Telecom

Response to

the OFTA Public Consultation on

"Licensing Framework for Third Generation (3G) Mobile Services"

19 May 2000

Executive Summary

CCT welcomes OFTA's consultation on the "Licensing Framework for third generation Mobile Services" and is pleased to submit this Response to reflect CCT's suggestions on the official UMTS licensing activities. CCT hopes that this response will help OFTA to identify and define in a better sense the expectation of the coming 3G players in terms of regulatory and licensing regime required.

The 3G market is considered to be a truly multimedia market covering applications of various kinds and different mobility speeds. The regulatory framework is therefore mandated to act along in this direction in order to enhance types and level of services to be provisioned to the mass market.

In response, we are of the opinion that :

- The Spectrum as recommended by the UMTS Forum be employed in Hongkong
- Air interfaces of UTRA TDD & FDD, and its recommended spectrum should be licensed simultaneously during the forthcoming licensing exercise in Hongkong
- 2G should have the capability to roam over to the 3G network, and vice versa
- (3 + 2) 3G licenses for incumbent and new operators are recommended to be issued in Hongkong
- The OFTA should employ a light-handed approach in regard to the 3G regulatory exercise, and market force should be the dominating factor to govern the flow of any regulatory regime. In addition, the regulation for content provisioning should be separated from the telecommunications regulation to the extent possible

We believe that in general the existing regulatory framework of OFTA is adequate, and we also highly appreciate the current line of thinking by OFTA to introduce the 3G technology in Hongkong at this point of time.

The Role of CCT in the future 3G Operations in Hongkong

Although CCT by itself is counted as an emerging carrier, CCT is fully engaged and committed in the activities and studies of UMTS technology. To this purpose we have negotiated and shortlisted one of the prominent European 3G vendors to conduct testing shortly once formalities are started and done. As everyone knows, we have a thick content to provide in the internet world in the Greater China region, and is an active local ISP and WFTNS provider.

General Considerations - The CCT Vision on UMTS

UMTS will integrate the current separate worlds of fixed and mobile telecommunications services in a digital data environment everywhere. This means that the user can conduct various telecommunications activities, going from voice with value added, fax and e-mail, audio/video streams to multimedia services all based on a seamless mobile transmit/receive platform.

In short :

- UMTS would meet user demands in the areas of telecommunications, internet, computing and entertainment industries

- UMTS will provide full flexibility and backward compatibility with the existing 2G in order to cope with future user's needs dictated by a high increase of user density, airtime per user and net information throughput per user

- The ETSI version of UMTS terrestrial radio air interface 'UTRA' offers the opportunity to overcome GSM limitations by deploying seamless user services via two adaptive modes, FDD and TDD. Both modes target at overlapping applications, deploy additional spectrum with enhanced throughput or spectral efficiency and are gaining momentum by operators and vendors worldwide.

In addition, the vision for the future of communications must start with the consumer who will want to communicate at any time, anywhere, with the same ease and facilities as if "at home". As can be seen, the term "virtual home environment" (VHE) was invented to encompass the full range of the Universal Mobile Telecommunications System (UMTS) concept wherein the network the customer uses is transparent and any distinction between "fixed" and "mobile" will be increasingly blurred if not eliminated. The "Information Society" will be a society on the move and the customer will want a seamless service, not only in terms of networking, roaming and handover, but also in relation to customer management activities such as billing.

UMTS Applications

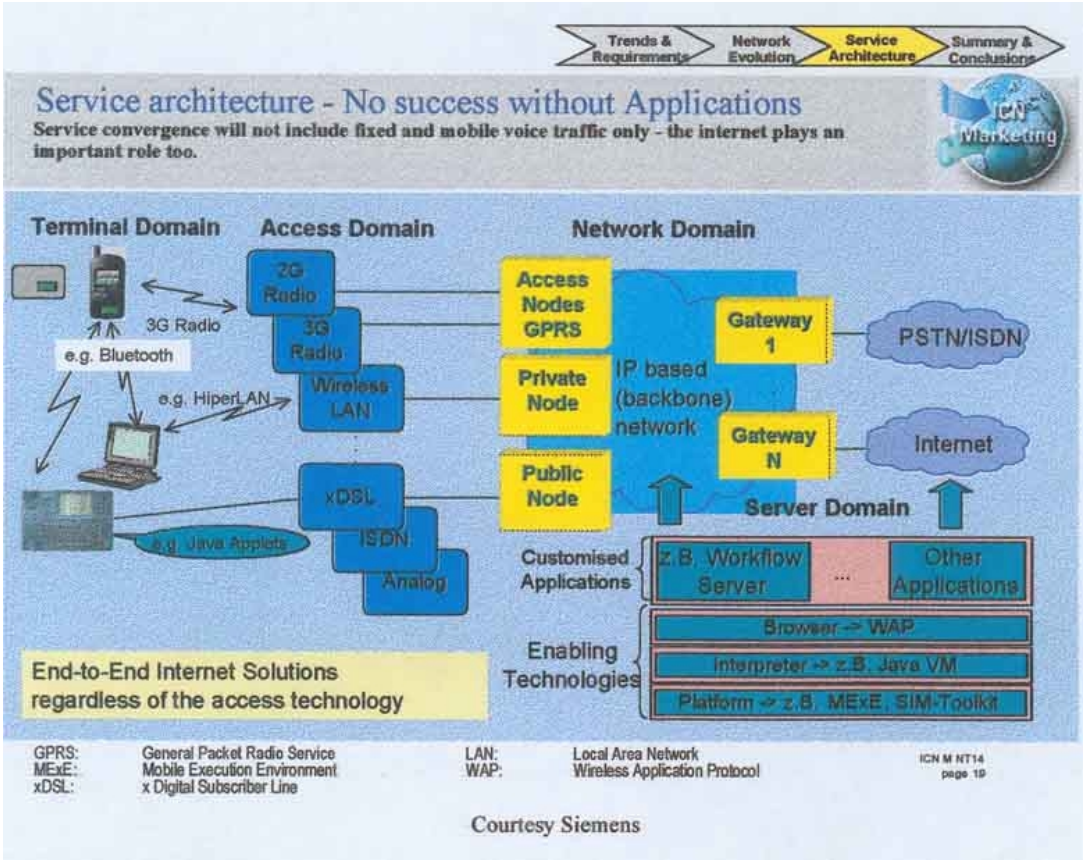
The UMTS story is beginning by the early adoption of future broadband telecommunications services of say, HSCSD (High Speed Circuit Switched Data) and GPRS (General Packet Radio Service) compounded with the phenomenal convergence of the two industries - Information and Telecommunications, and the desire a customer to be fully personalised with his communications capability.

UMTS will support a full range of services from voice over narrowband up to wideband services. Packet data traffic will be the bearer for the wideband services. In comparison to 2G, and in compliance with the ETSI requirements, UMTS supports data rate capabilities of :

- at least 384 kbit/s with high mobility (<=120 km/h) in suburban outdoor environments,
- at least 2 Mbit/s with low mobility (<=10 km/h) in indoor and low range outdoor environments.

As a result, these will materialise into new applications over one's handset, and that makes 3G handset or system a real personal communications system.

A possible deployment scenario as shown below:



In consequence, third parties will be given the possibility to easily create innovative services: beside network operator themselves, we believe that the following players will also develop 3G services:

- Service providers and ISPs
- IT software and hardware vendors
- Retailers
- Banking institutions
- Transport companies, etc.

As a result, the opportunities for creating differentiating services will be much higher and a large number of service providers will offer a large number of different services.

UMTS Air Interfaces

As stated, the ongoing technology standardisation process has led to the incorporation of two air interface technologies defined in two operational modes, i.e Frequency Division Duplex (FDD) and Time Division Duplex (TDD).

The FDD mode (using W-CDMA) is better suited for application in the bigger cells (public macro and micro cell environments). It can handle symmetrical traffic with data transfer rates up to 384 kbit/s with high mobility.

The TDD mode (using TD-CDMA) is ideally suited for application in the smaller cells (public micro and pico cell environments and indoor coverage). Furthermore it is an ideal technology for public wireless local loop. Only the TDD mode is suited for very high data rates up to 2 Mbit/s (in the low mobility environment) and for the increasing asymmetrical traffic demand.

The technical edge of the above stated Air Interfaces lies in its significant increase in system capacity and higher data transfer rates. The higher data rates ultimately mean that UMTS services can be delivered seamlessly from residential indoor environments to the global roaming area. In situations where seamlessness is neither adequate nor feasible, a close service interworking on network level will be achieved. Only TDD/FDD dual mode operation supports all these UMTS market requirements.

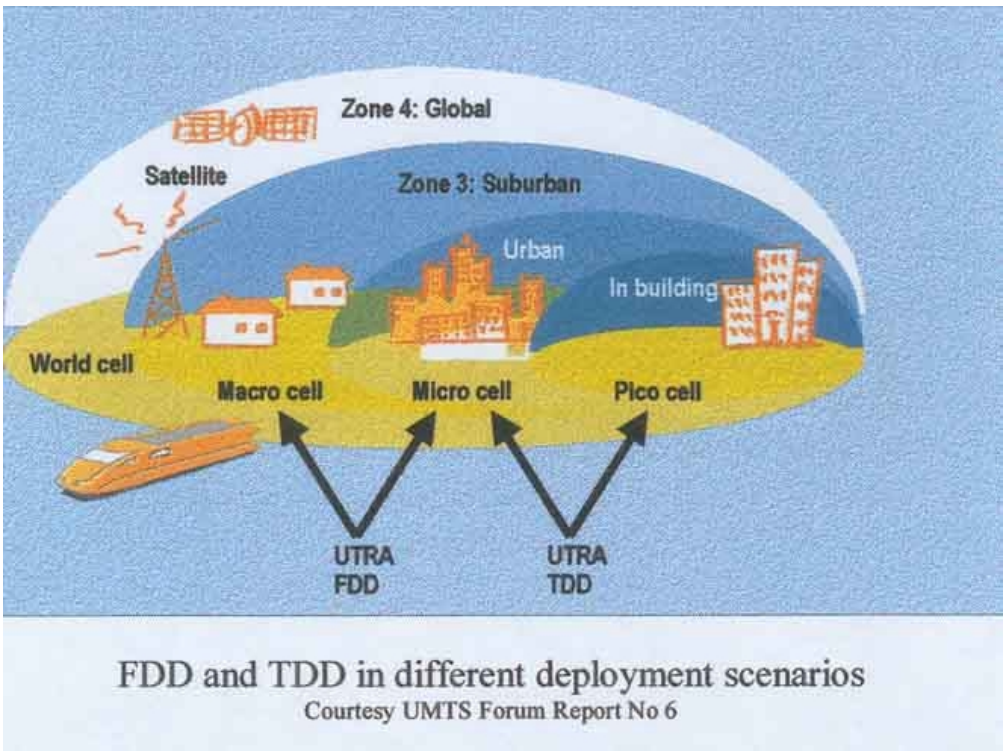
As generally understood, CCT believes that each of the modes is better suited for certain types of applications: FDD is more appropriate for bigger cells applications (macro and micro) and for symmetric traffic up to 384 kbit/s, whereas TDD systems better matches the requirements of small cells (micro, pico and indoor), and bursty traffic up to 2 Mbit/s with typical asymmetric traffic applications.

Again the introduction of UMTS will be deployed as an overlay network to GSM, mainly used in high subscriber density regions. Paired frequencies with FDD systems, unpaired frequencies preferable covered with the TDD systems. CCT fully supports the UTRAN concept with the two radio access modes, FDD and TDD, and will work with the two systems simultaneously once technology and equipment availability allow.

Due to the growth of data-oriented traffic via Internet, Intranet and web services the demand for asymmetric data rate capacity will increase tremendously in the near future.

Therefore the efficient handling of asymmetric traffic in modern telecommunication networks will become a key prerequisite for saving costs and spectrum resources - with TDD it is possible.

The following figure illustrates the different service areas with the most suitable UTRA mode.



FDD and TDD in different deployment scenarios
Courtesy UMTS Forum Report No 6

CCT believes that each UTRA mode has its advantages in different deployment scenarios.

Therefore CCT will provide services once licence is applied and obtained, to handle both modes in an integrated solution.

The New Bailgame

In UMTS, there will be a new chained set of roles for network operators, service providers and content providers alike.

Namely, the Network operators act as a transport backbone between any two points, be they fixed or nomadic. Whereas as far as the Service providers are concerned, they develop, deliver and market applications to end users, e.g. traffic or daily weather forecast. They are the main point of contact with the end users. Lastly, the Content providers deliver the content required over today's cyberworld. All these will define a new set of new rules for the players to follow, and in turn it may offer opportunities for the existing 2G players to offer their 3G services to the public.

Point-to-point Answers

2. Standards issues

3G Standards in Hongkong - Single or Multi-standards?

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 to ensure 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 terminal. The TA invites views from the industry on his proposal.

Current UMTS licensing activities in Europe show that the UMTS standard with its two modes, FDD (using WCDMA) and TDD (using TD-CDMA), is preferred by most operators although the regulatory authorities allowed all IMT-2000 standards. The advantage of an unique radio access technology in each mode is that no extra spectrum is needed for guard bands between different radio access technologies, and even if in reality a minimal guardband is required, our proposal of 3 + 2 licence issuance for incumbent and new players altogether can accommodate such a guardband requirement between TDD and the current PHS/DECT band (please see section : Individual Operator's Bandwidth Requirements).

Therefore CCT proposes to use WCDMA for FDD and TD-CDMA for TDD in HongKong.

3. Spectrum Issues

Availability of Spectrum for 3G Systems

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 necessary between TDD and FDD systems of the 3G services, there will be 2 x 60 MHz paired spectrum and some 25 MHz to 29 MHz unpaired spectrum available for terrestrial 3G mobile services in Hongkong at this stage

The proposed frequency spectrum by OFTA allows the offering of 4 to 5 3G licences in Hongkong. Each licence is sufficient to build up a competitive 3 G network with modular multiple layer structure as outlined by UMTS forum papers. The restriction, that the spectrum from 1885 to 1906.1 MHz cannot be

used at the moment did not affect the issuance of the 3G licence, in fact a 5MHz frequency spectrum in the unpaired band is available for each licence.

We also suggest to have a wider unpaired bandwidth, or mixed mode of operations for the FDD/TDD spectrum, to cater for the growing data asymmetry ratio.

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

Most players, including CCT is willing to participate in a later stage once any further development by ITU on the IMT-2000 is seen, and on a second round of consultation paper should OFTA be willing to do so.

3G Services in 2G Spectrum

To allow existing 2G mobile operators to evolve their networks to 3G and to be in line with the adoption of the technology neutrality policy, the TA intends to open to the existing 2G 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 in the market, 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.

We endorse the idea that the reuse of existing 2G frequency spectrum for 3G technology or services is recommended.

CCT believes that in order to meet the expectations of any would-be losers because of the number of limitations of 3G licences that can be issued, it is suggested to incorporate and accommodate any 3G services within the current 2G band of operations, once equipment availability is met, such that a full extent of resources utilisation and a serious market driven competition can be in place.

Band Plan for 3G services

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

About 42 European member states are members in CEPT. CEPT decided to take the following spectrum for IMT-2000 allocation out of the ITU

recommendation in the 1st step: 1900-1980 MHz, 2010-2025 MHz and 2110-2170 MHz for terrestrial UMTS applications. For TDD operation 1900-1920 MHz and 2010-2025 MHz are planned. 1920-1980 MHz is paired with 2110-2170 for FDD operation. The frequency band 1920-1980 MHz may also be used for TDD operation.

Considering the success of GSM and taking into consideration that the CEPT member countries followed more or less the CEPT decisions, CCT recommends to follow the CEPT decision for IMT-2000 as well, in terms of a very realistic issue : 3G equipment availability.

Individual Operator's Bandwidth Requirements

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 full range of 3G services including the high speed multimedia services at 2 Mbps in an indoor environment. For incumbent 2G operators, the TA considers that less spectrum would be required because they can upgrade their 2G system 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 licences 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.

CCT, according to the recommendations of the UMTS Forum, considers the 2x15 MHz + 5 MHz scenario as an efficient lot size for a license holder for full UMTS service capabilities, i.e 2x15 MHz in the paired bands plus 5 MHz in the unpaired band.

This amount of spectrum per operator is justified because of the amount of traffic that is forecasted (refer to the UMTS Forum reports) and to provide an operator with enough flexibility to build a hierarchical three-layer radio coverage that is required when high bandwidth demanding services are implemented. In this context we would like to repeat the recommendation from the UMTS Forum that a separate frequency carrier should be reserved for low-mobility users: pedestrians and quasi-stationary users will generate a substantial portion of the expected traffic in UMTS especially in urban areas.

Note: CCT preferred that the proportion of spectrum in the unpaired band to be enhanced versus the paired one, in order to be in line with the type of traffic that can be expected in a mobile multimedia network.

The proposed spectrum allocation for Hongkong would allow for five licenses as done in the UK, or already planned in many other European countries having 4 GSM networks in place. In terms of number and bandwidth of licensing, CCT suggests to have :

- three for existing mobile operators in Hongkong to obtain each a licence of 2x10 MHz FDD and 5 MHz TDD, and two additional for new entrants each to have 2x 15 MHz FDD and 5 MHz TDD configuration in order for new players to have a chance to participate in the new Mobile multimedia businesses.

Bringing in additional/new operators will certainly drive down customer end pricing and the level of enjoyment the public is foreseen to have, and the 2x 10/15 MHz allocations for existing and new players are deemed to be fair in terms of respective ultimate bandwidth enjoyment taken both by incumbent and new players eventually, and their respective ability in providing a true mobile multimedia services to the public in Hongkong.

For the limitation to 2x 10 MHz and the unpaired band for existing operators we agree to the view of OFTA, that for incumbent 2G operators a spectrum of 2 x 10 MHz is efficient and effective because their 2G system can be migratory, and utilise such band to provide the macro layer coverage.

We believe it is essential for the development of the local UMTS market to enable this 3G spectrum segregation for new entrants.

Allocation of TDD spectrum

The TA 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 band 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.

Most entrepreneurs believe in free market economy. The TA should re-ask : when is the appropriate time, if this is not the right moment to issue any TDD spectrum, and what is the associated implicit cost incurred for a later round of TDD issuance, if required ? Should the TDD unpaired be issued at a later stage, in the mean time, is there any specific assignment or applications spared for this un-allocated spectrum ?

4. Licensing Issues

Need for new Entrant and Incumbent Operators

In view that 3G technologies may provide the 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 the industry and consumers. The TA therefore considers that the introduction of new entrants to the 3G market will beneficial to market development and to consumers.

As stated in the foregoing section, CCT agrees on the view that new entrants should be brought into the arena. We also believe that bringing in additional/new operators will stimulate sound competition in this new market.

Selection of Operator by Spectrum Auctioning

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

With respect to license procedure, CCT shares the viewpoint of the UMTS Forum: we recommend a "beauty contest" procedure to be used to select UMTS operators.

Auctions lead to high up-front fees, which certainly will increase the tariffs for the consumers, slow down the development of new, innovative services in regard to UMTS services, and will diminish the infrastructure investments scale and eventually harm competition.

If Hongkong is to have a leading role in 3G technology for the Asian markets, a quick and cost effective rollout of the new technology is absolutely necessary. A very high investment in the licence, as seen in Europe these days, could have an adverse impact on the business plan of the operator.

We think that commitments towards rollout and coverage and implementing new multimedia services are of major importance in the decision process. As already mentioned, the future success of an UMTS operator will be largely influenced by the partnerships that will be established with service providers, content providers, media organisations, and also commitments with respect to these partnerships may be important factors when deciding on the UMTS licenses.

5. Regulatory Issues

Similar regulatory Framework for Mobile Telephone services applies to 3G

The 3G mobile system 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 in 3G market.

CCT agrees the principle that any Telecommunications regulation must be separated from content regulation as much as possible. The rules governing the telecom network and service providers should be similar to that of 2Gs, whilst the rules for content providers should be controlled under a separate ones

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

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

We agree with OFTA's proposition that there will come a day that fixed and mobile will become seamless, and we suggest OFTA to take lead on the pioneer study in terms of regulatory issues and policies to be imposed. In the mean time, the demarcations are still there.

We believe that there are two key principles for the regulatory approach to this converging environment:

- UMTS licensing conditions should be formulated within the current regulatory framework, but there should be clarity as to what licensing regime and conditions are applicable to converged fixed/mobile services and networks; this of course is facilitated by technology neutrality of the regulation.

- the development of UMTS services should be market, not regulatory, driven, so that migration paths from both fixed and mobile network infrastructures can be enabled, inferring that there can be no single scenario for convergence.

Domestic Roaming between 2G and 3G networks

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

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 like to seek views on the technical and commercial implications such a roaming arrangement and whether there are technical and operational difficulties in roaming from 2G to 3G networks.

CCT is of the view that there is in theory a definite or mandatory requirement for the incumbent operators/subscribers to be roamed to the 3G network, and vice versa, in view of the critical mass that have made their commitment on the existing 2G network. Technically we deem it is less likely of a concern as compared to the commercial side of the business.

However, in view of the much difficult issue of roaming consolidated on a commercial package amongst carriers, history in Hongkong told us that inter-carrier roaming amongst 2G carriers could not take place due to the fear of taking advantages from one another, and this would likely taking place again between 2G and 3G providers.

We therefore 'pre-empt' OFTA to introduce regulatory policies with inclination on this side of the issue more.

Separation of Service provision from network Operation

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.

We identify with the point that there will be different roles emerged out as depicted in the foregoing section. In addition, we think that convergence is expected to take place at the services level rather than at the network level. The capabilities of UMTS will enable such a convergence of services between telecommunications, cable and computer networks and broadcasting, as well as between fixed and mobile environments. The regulatory framework should ensure that no regulatory barriers are maintained or created that could hinder this development.

We would like to emphasize that in regard to the regulatory regime for service and content provisioning, licensing conditions should be minimal (if required at all). In this respect we repeat that content regulation should be separated from telecommunications specific regulation to the extent possible.

OFTA should also regulate to the UMTS operators that they should offer a non discriminatory access to the independent service providers. We believe this mainly should be achieved by existing competition legislation.

In addition, with respect to regulatory issues on Separation of Service provision from network Operation, CCT shares the viewpoints of the UMTS forum . The UMTS Forum sees different functions, which each player cross-sector can play in UMTS; there is in the view of the Forum that no preference to the one or the other role. All players should have the same opportunity to fulfil one or more functions. In the longer term the regulatory objective by OFTA is advised to minimise sector-specific regulation and to rely mostly on competition rules.

CCT also believes that the role of (independent) service providers will become much more important in 3G than it was in 2G.

Mobile Number Portability

The TA intends to set out MNP as a mandatory requirement in the licensing conditions of the forthcoming 3G licences.

Positive. We encourage the current MNP mechanism of 2G to be introduced as part of the launching requirement for 3G operators.

Numbering requirement

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

Positive and we are of the opinion that it is not a concern at all in terms of numbering resources and network complexity. However, in view of the subscribership, one may like to retain his or her 2G 'lucky' or special number to be roamed over to his or her new 3G subscription. As such, this may pose a database and call processing implications as far as the network complexity is concerned.