June 17, 2004

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

Attention: Senior Telecommunications Engineer (Technical Regulation) 2

Via Fax: 852 2803 5112
Via Email: 2g-consultation@ofta.gov.hk

The CDMA Development Group (CDG) appreciates this opportunity to provide comments to the Office of the Telecommunications Authority (OFTA) with regard to the March 19, 2004, consultation paper entitled *Licensing of Mobile Services on Expiry of Existing Licenses for Second Generation Mobile Services: Analysis of Comments Received, Preliminary Conclusions and Further Consultation*. The CDG and its members have a keen interest in this proceeding as many of the decisions resulting from this consultation will affect the ongoing deployment of CDMA in Hong Kong and throughout the region.

The CDG is a non-profit international consortium of over 100 companies, including the world's leading operators and manufacturers of digital cellular, personal communications services (PCS), and third-generation systems based on Code Division Multiple Access (CDMA) technology.[1] The CDG's mission is to lead the rapid evolution and deployment of CDMA-based systems, based on open standards and encompassing all core architectures, to meet the needs of markets around the world.

CDMA is the fastest growing technology worldwide with over 202 million subscribers across all continents; more than 40 percent of these customers are based in the Asia-Pacific region. Asia-Pacific is the fastest growing region for CDMA, with a 43 percent increase in subscribers during the year ending March 2004. The growth of CDMA in the Asia-Pacific region has been very strong with the introduction of CDMA2000® in many markets including China, Taiwan, India, Japan, Korea, Thailand, and Vietnam. CDMA2000 1X was launched by SK Telecom in October 2000, the first commercial deployment of an IMT-2000 system. Today, there are 18 CDMA2000 1X and 4 CDMA2000 1xEV-DO

[1] CDMA is a digital air interface that builds on the concept of employing a unique code to distinguish each call, enabling the most efficient use of a given spectrum range, and providing greater capacity over a wireless network. CDMA is a spread spectrum technology that allows many users to occupy the same time and frequency allocations in a given band. It is the basis of several International Telecommunication Union standards for third generation networks, i.e., CDMA2000, W-CDMA/UMTS, and TD-SCDMA.

575 ANTON BOULEVARD, SUITE 560
COSTA MESA, CALIFORNIA 92626
PHONE +1 888 800-CDMA
+1 714 545-5211
FAX +1 714 545-4601

WWW.CDG.ORG, CDG@CDG.ORG

commercial networks, and 52 million users in 12 countries throughout the region. In Japan, KDDI has added over 13 million CDMA2000 1X subscribers since April 2002, and now controls over 85 percent of the 3G market in Japan. China Unicom added 21 million CDMA subscribers in the first two years of operation.

The CDG recognizes the importance of Hong Kong as both a regional hub and economic bridge for the region, and we urge OFTA to adopt policies that will support multiple radio air interfaces for the provision of mobile communications in Hong Kong. The CDG supports OFTA's proposal to offer a new license in the 800 MHz band with requirements for quality mobile data service and coverage. In addition, the CDG encourages the TA to consider the issuance of a second new license in the 883-890 MHz/928-935 MHz band. The CDG believes that the offer of such licenses will ensure the competitive provision of CDMA2000 services in Hong Kong.

The CDG believes that the Hong Kong market can support additional high-speed mobile wireless service offerings. Further analysis by independent consulting firm, Telecommunications Management Group, Inc. (TMG), shows that that introduction of these new services in the 800 MHz band should provide significant consumer benefits in terms of both penetration and use. This analysis is contained in the attached paper entitled "Prospects for High-Speed Mobile Wireless Services in Hong Kong."

The CDG supports this consultative process and we provide the following specific comments related to paragraph numbers from the consultation document.

¶¶ 15, 26

The CDG believes that all incumbent licensees should be granted the right of first refusal, regardless of the 2G technologies in use or the current number of customers. However, the CDG suggests that there should be conditions put in place to ensure that the incumbents make efficient use of their spectrum. Such conditions could be drawn out of the discussion in ¶¶ 71 through 86 of the consultation document and specifically include coverage and roll-out schedule requirements.

In addition, the grant of the conditional right of first refusal to all incumbents would provide a level playing field for incumbent operators because all operators would have to meet the same conditions regardless of the status of their existing 2G networks. The grant of this conditional right of first refusal would satisfy two of OFTA's goals, namely, ensuring continuity of service for the incumbents' customers and efficient use of scarce spectrum resources.

¶¶ 18, 19

The CDG supports OFTA's views that it is not necessary to align the dates of the new licenses, nor should requests for extension of PCS licenses be granted. The CDG believes that there should be, at most, minimal changes to licenses after they have been granted. OFTA's inclination to allow existing licenses to expire as currently scheduled provides a

degree of regulatory certainty for the mobile telecommunications market. Current and future operators rely on this regulatory certainty when developing and revising their business and operational plans. Additional extension or early termination of existing licenses imparts a level of uncertainty to the market which can disrupt such planning by operators and could have a negative impact on Hong Kong's attractiveness to potential operators and investors.

¶ 43

The CDG supports OFTA's proposal to offer a new license in the 825-835 MHz/870-880 MHz band, including license conditions requiring quality mobile data services and coverage commitments. We believe that the technology-neutral approach suggested by OFTA will allow the new entrant to choose the technology that suits it best while also meeting the license conditions.

In addition, the CDG encourages the TA to consider a similar proposal for Block B (883-890 MHz/928-935 MHz). We believe that offering a new license would be the most efficient use of this spectrum, enabling new or existing carriers to bid on the license on a technology-neutral basis.

The CDG believes that a carrier deploying a CDMA2000 1X and CDMA2000 1xEV-DO system in Block A or Block B will be able to meet and possibly exceed requirements developed by OFTA, and would be a key component in OFTA's plan to spur the development and use of a variety of innovative wireless applications.

The CDG also notes that the proposed Block A license will fall within the 824-849 MHz/869-894 MHz frequency band, one of the most widely used bands in the world. This spectrum is available in the United States, Canada, Latin America, Korea, China, Taiwan, and parts of the Middle East, Africa and Central Asia. The new licensee will therefore have significant potential to provide roaming service to travelers from Mainland China and elsewhere whose home markets have mobile service in this band. Given the large number of CDMA operators in this band, the CDG believes that a CDMA2000 operator would best be able to serve the roaming needs of these visitors.

¶ 46

The CDG does not support the TA's proposal to reserve Block B for the future expansion and frequency rationalization of the incumbent GSM and PCS operators. This proposal would effectively accommodate only operators using a specific technology platform. As one of OFTA's goals for the mobile market is to encourage efficient use of spectrum, the existing operators should be encouraged to implement spectrally efficient technologies in their existing spectrum, rather than to be assured that they already have additional spectrum set aside for them. The CDG urges the TA to instead consider providing an opportunity for new and existing operators to acquire this spectrum on a technology neutral basis.

¶¶ 50, 52

The CDG agrees with OFTA's view that it is not prudent to assign the unallocated TDD spectrum at the present time. While OFTA may consider making the unallocated TDD spectrum available to the current 3G licensees if they encounter capacity constraints with their existing licensed spectrum, OFTA should await further development of the services in the TDD spectrum before assigning the unallocated spectrum.

Similarly, the CDG agrees with OFTA's proposal to reserve the 1980-2010 MHz/2170-2200 MHz and 2500-2690 MHz bands for future use until future developments give OFTA a clearer view of the best use for them.

¶ 60

The CDG supports the TA's proposal that incumbent 2G operators should be allowed to participate in the licensing exercise for Block A. As the consultation paper correctly notes, allowing the incumbent bidders to participate will encourage greater participation in the license auction and will ensure that the auction results reflect the true value of the spectrum. Incumbent operators should be permitted to bid on an equal footing with all other interested bidders following the incumbents' right of first refusal.

As the TA notes, the new licensee's financial and operational requirements will ensure that the winning bidder, whether an incumbent or a new entrant, will make the most efficient use of the spectrum in order to maximize their return on investment.

¶ 90

The CDG advises OFTA to exercise caution in determining specific targets for an active level of mobile data usage in the Block A license conditions. While the CDG supports OFTA's goal of encouraging the development and deployment of advanced and innovative data services as a result of the new license award, we suggest that OFTA consider not just technology neutrality, but also flexible use of the spectrum to be awarded. As this Consultation recognizes in ¶ 43, the bandwidth of each CDMA2000 carrier is 1.25 MHz and the new licensee will be able to flexibly allocate the available carriers for either voice or data services. In the spirit of such flexibility, the CDG recommends that the license conditions encourage the licensee to promote data services, but that the operator retain the capacity to decide how best to divide its channels between voice and data.

The CDG notes that one of the characteristics that separates CDMA2000 1X and CDMA2000 1xEV-DO from technologies currently deployed in Hong Kong is the ability to provide robust and high-speed data transfers of up to 3.01 Mbps. A CDMA2000 carrier operating under the new license would have an incentive to offer and promote innovative data services both as a generator of higher margins and as a means of differentiating itself from its competitors.

Given the combination of market forces making data services attractive to a CDMA2000 operator and OFTA's stated goal of promoting data service innovation and use, the CDG does not believe specific strict mobile data usage targets are necessary. Instead, we recommend that the TA work with the new licensee to ensure that its business plan meets the TA's goals.

The CDG appreciates this opportunity to comment on OFTA's consultation. We look forward to participating in this process. The CDG would be pleased to meet with OFTA officials to discuss our positions further and provide additional information that OFTA may request in support of its inquiry.

Sincerely,

CDMA Development Group

Perry M. LaForge
Executive Director

Prospects for High-Speed Mobile Wireless Services in Hong Kong

analysis
prepared by

Telecommunications Management Group, Inc.
June 2004

Prospects for High-Speed Mobile Wireless Services in Hong Kong

INTRODUCTION

In its recent Document entitled 'Licensing of Mobile Services on Expiry of Existing Licenses for Second Generation Mobile Services: analysis of Comments Received and Preliminary Conclusions and Further Consultation' (March 19, 2004), OFTA very specifically identified its over-riding objective for mobile services, namely, to 'stimulate the development of mobile data'. On March 25, 2004 the reasons for OFTA to focus on mobile data were further articulated in a related speech to the Telecoms InfoTechnology Forum by M.H Au, the Director-General and are:

- the low level of data use by mobile network subscribers in Hong Kong
- the low penetration rate of mobile data users in Hong Kong, especially when compared to Japan and South Korea, and
- the small number of accessible web sites available to subscribers in Hong Kong.

These concerns exist even though it is well recognized around the world that Hong Kong has one of, if not the, most competitive markets for mobile voice service and again, probably the highest penetration and average use of mobile voice service. The OFTA position clearly recognizes that there are separate markets for 2G and 3G mobile services for different services. While 2G services can be said to 'provide access' to consumers, 3G services 'package access' along with content and applications that are only feasible with high-speed data transmission rates. Accordingly, given the mature state of competition in the provision of 2G services in Hong Kong as opposed to the fledgling state of 3G availability, a completely different regulatory calculus is called for.

The analysis underlying the regulatory framework proposed by OFTA in the 'Further Consultation' includes the following:

i. OFTA proposes to make available via auction Block A of the 800 MHz band (825-835 MHz for Rx) and (870-880 MHz for Tx)
ii. Block A of the 800 MHz band is assigned to CDMA2000® in Mainland China
iii. Block A can support CDMA2000 1x EV-DO
iv. Block A can also support GSM 850 but GSM 850 offers no additional capability beyond that of GSM 900
v. Block B (883-890 MHz/928-935 MHz) is reserved for future use

vi. OFTA will not mandate CDMA2000 but all license conditions will be enforced [including coverage of at least 50% of the population within 3 years of license grant at peak data rate per radio carrier of at least 2 Mbps]

While the focus of this proposal is on the rollout of high-speed mobile wireless services, even for the limited, current data services that are available, Mr. Au mentioned that he believed that 3G networks could provide mobile data at prices 'at least an order of magnitude' less than 2.5G networks. The deployment of 3G networks and the related competition is therefore an important policy tool for the development of all mobile data services.

However, opposition has arisen to OFTA's proposal to introduce another high-speed mobile wireless services operator using the 800 MHz spectrum that was previously issued to HCL for a CDMA network. This opposition is based on the argument that there is 'no room' for a 5th high-speed mobile wireless services network in Hong Kong.

TMG believes that this argument is fallacious and serves the interests only of some of the current 3G operators rather than the interests of Hong Kong consumers. In the first instance, this argument presumes that the regulator manage the market for high-speed wireless services – and knows (as implicitly does the industry) the actual size of the market, and optimal revenue and costs for the competitors. Secondly, the focus of the argument is on the affects of competition on operators, rather than consumers – both residential and business. Neither proposition is correct.

The notion of 'room' for a network is based upon economic considerations of demand (Hong Kong's population is normally cited) and also supply factors.

As to demand, there are a number of issues that must be considered. First, the level of demand is based upon the number of customers but also the usage levels of those customers. Accordingly, the prices charged in the market can have a dramatic influence on both the numbers of customers and their use – and the number of network choices available is a major factor affecting price. In looking from market size at one stage of technological and competitive development to another, this expansion is often termed 'pent-up demand' which is released as supply increases. Also, as the overall population size will continue to grow, additional customers will contribute to future demand levels.

Another demand factor is that, should a new advanced network utilize CDMA2000 technology, roaming services would be available to over 200 million CDMA users worldwide, 84 million of which are in the Asia/Pacific region with 24 million in Mainland China. This is a clear source of potential demand for a new network.

Supply considerations must also be incorporated into any analysis of 'room' for an additional network. A network utilizing the 800 MHz frequency band requires fewer base stations than one in the '3G' bands. This is true for both CDMA2000 and W-CDMA. The CDMA Development Group (CDG) has estimated that a single CDMA2000 cell site operating in the 800 MHz band can cover a radius of 29.4 km

whereas a cell site operating at 1900 MHz can cover only 13.3 km. This difference translates to a relative cell count at 1900 MHz which is almost 500% greater than for a network operating in the 800 MHz band. Accordingly, a network operating in Block A can be a substantial competitive force.

Also, for a locale such as Hong Kong that has a very high population density, overall network costs – for all technologies – are lower per capita than for more dispersed and geographically larger markets.

Another supply factor that can affect both the cost and the timing of network rollout is that – for a CDMA2000 network – when cdmaOne™ infrastructure is in place, the marginal costs of an upgrade are substantially less than construction of a totally new network.

As Mr. Au noted in his speech, 'the task of the regulator is to protect competition and not competitors'. OFTA can best serve the interests of consumers by introducing a new network into the market and, in doing so, replicate the great success that 2G technology has brought to Hong Kong. Further, to bring about the most rapid deployment of network facilities in the re-farmed spectrum band, OFTA should reverse that part of its proposal that limits 'right of first refusal' to GSM and PCS licensees.

THE HISTORY OF MOBILE SERVICES IN HONG KONG

The market for mobile voice services in Hong Kong is one of the most competitive in the world. Six operators run eleven networks and this level of competition has resulted in low prices and high penetration rates. The penetration rate is, as reported by OFTA on June 7th of 2004, an amazing 107.9% with the world's highest average customer use – a public policy success on all counts. Yet even with this high degree of competition, five of the six operators announced profits in 2002 according to Ure in 'Hong Kong's Mobile Market in Perspective' (December 2002). As of 2003, data indicate that the current licensees are all EBITDA or cash flow positive.

Last year, OFTA commissioned a study by Spectrum Strategy entitled 'Report on the Effectiveness of Competition in Hong Kong's Telecommunications Market: an International Comparison'. This study – using 2002 data – provides some important insights into the mobile licensing issues facing OFTA today.

Some of the most significant finds are:

- Although the mobile market for 2G services, predominately voice, is highly competitive, the competition comes almost exclusively from the network operators directly, as the six MVNOs that are active have collectively only one percent of mobile customers.
- The market concentration of the mobile market (as measured by the Herfindahl-Hirschman Index) is the lowest compared in the study (and the lowest for countries where data is available), indicating a very high degree of competition. This degree of competition far exceeds that of Japan and Korea.

- Not surprisingly, the mobile take-up rate in Hong Kong in 2002 was some 35% greater than that in Korea and 46% greater than in Japan (and probably higher as of 2004), particularly when it is observed that the Hong Kong penetration rate in June of 2004 was 107.9%
- The purchasing power parity adjusted mobile charges, as a percentage of real disposable income in Hong Kong, is substantially less than either country
- This high degree of network competition is estimated to have saved Hong Kong consumers over HK $ 70 billion from 1996-2002.
- Yet the level of telecommunications investment in Hong Kong from 1991-2001 (although not just for the mobile sector) greatly exceeded that in both Japan and Korea.
- The only sector which indicates some disappointment given the general success story of liberalization is the 'data access sector' which actually has been experiencing a reduction in narrowband use and a broadband penetration of only 14.2%. Most interestingly, there is NO MENTION OF MOBILE in the section on 'data access'.

Accordingly, OFTA's recent proposal, specifically addressing the mobile data sector, is well focused and targets possibly the last remaining major market which has not experienced the benefits of previous liberalization policies.

This market structure for 2G mobile services described in the Study, however, came about only because of active monitoring and analysis of market developments by OFTA.

In 1984, OFTA issued three GSM licenses, only issuing the fourth in 1992. Prior to 1992 the number of cellular customers was low and growing slowly. The introduction of full network operation by the fourth GSM operator in 1994 did result in customer growth but not enough to convince OFTA that the market's full potential was being achieved. Accordingly, in 1996 – without concern for whether there was 'room' in the market – OFTA issued six additional licenses to PCS operators. It was at this point that the explosive growth in number of customers occurred.

At the time of these policy actions, however, OFTA did address its concerns with demand forecasts for this sector. Specifically, OFTA noted that there were certain 'key' factors which made such forecasts difficult:

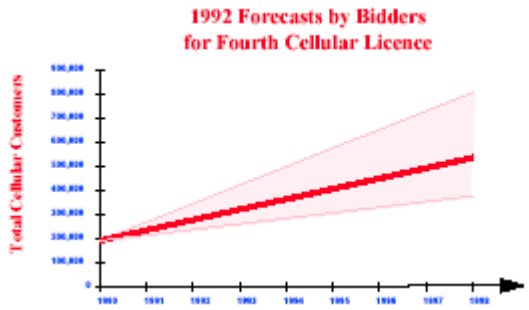
- when the technology is relatively new
- when the market is immature
- when technology innovations are developing at a rapid pace, and
- when prices are dynamic.

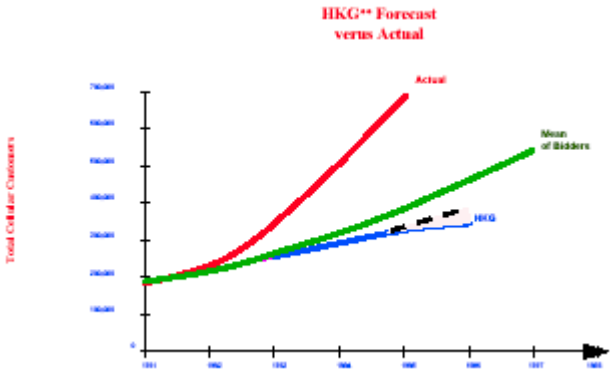
These factors are obviously present in forecasts related to high-speed mobile wireless services.

In addressing the 'room' contention (which is inherently based on market forecasts), it is instructive to review the market forecasts made by earlier license applicants. OFTA presented statistics at the Third Pan-Asia PCS (January 1996) in 'Hong Kong's

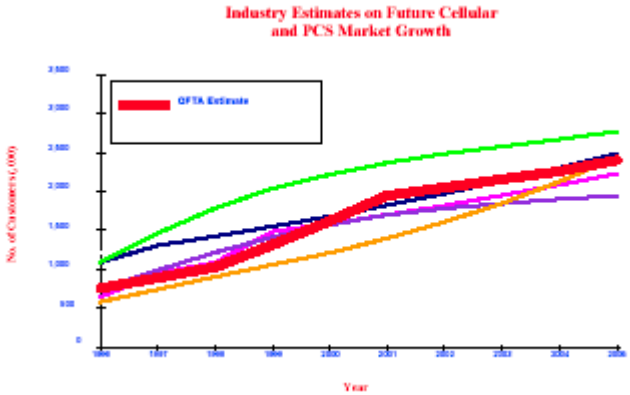
changing Mobile Market and its Implications' Summit. In 1992, the range of forecasts of the number of customers submitted by the various bidders had – for the year 1998 – a range of 375,000 to 805,000 with an average forecast of 535,000 mobile customers.

The actual number of mobile customers in 1998 was 2,900,000 – 540% greater than the average forecast.





A similar pattern held concerning the market forecasts submitted with bids for the PCS licenses. Estimates ranged from 1.8 million to 3.2 million customers by the year 2005, with OFTA predicting 2.4 million customers and a 32% penetration rate.



In fact, the actual number of mobile customers one year earlier than the forecast – January of 2004 – demonstrates that there are over 7.2 million customers, some 300 % greater than the OFTA forecast and a penetration rate of over 90%. As an interesting aside, OFTA did accurately forecast the population of Hong Kong in 2005 as 7.5 million. It was the 'pent-up' demand that was underestimated by the bidders as well as OFTA.

Rather than being an indicator of faulty forecasting, these differences actually demonstrate the impact of competition on market size. The average annual growth of subscribers between 1989 and 1993 was 50,000. This increased from 1994 to 1995 to 198,000 but from 1996 (PCS licenses issued) to 1998, the average annual growth was 707,000. The introduction of the PCS licensees [it should be recalled that there were 14 bidders for 6 licenses] therefore increased growth by a factor of over 350% in the first two years of enhanced competition. Since that time (December 1996), the number of subscribers has grown by 598% (as of February 2004). This growth in demand occurred throughout that time period, including during the telecommunications recession in the first few years of the decade.

The market structure based on maximum entry that generated this level of impressive growth and penetration can equally be effective in the high-speed mobile wireless services market if OFTA once again follows its principle of maximizing competition for the benefit of consumers.

THE CURRENT MOBILE DATA MARKET IN HONG KONG

OFTA recognizes the current 'shortfall' of data services in Hong Kong as compared to Japan and South Korea. At present, even with the low levels of data used by Hong Kong subscribers, the data is in largely the form of SMS, not a service that could easily serve as a precursor to the advanced data services envisioned by OFTA. The ITU noted that the 'majority of revenue from mobile data services comes not from GPRS but rather from humble SMS services' (contained in 'Broadband as a Commodity: Hong Kong, China Internet Case Study', May 2003). In statistics as of December of 2002, the ITU was correct as there were only 170,931 '2.5G customers' counted by OFTA. However, the subsequent introduction of GPRS has increased this customer category to 963,514 by February of 2004 according to operator statistics but Hong Kong remains well short of data use in most other economies in the region. A particular concern is in the data itself. OFTA's data concerning use is drawn from operator information and includes those customers that have 'joined' or 'used' the service. In contrast, the ITU employs direct customer survey data to obtain information related to consumer use of mobile data.

An overview of the ITU study on mobile internet services provides an interesting insight into the current state of activities in Hong Kong.

Using a number of benchmark comparisons, the Hong Kong 'shortfall' becomes evident as the summary 'mobile internet index' places Hong Kong – relative to comparable developed economies in the Asia/Pacific region – second to last, ahead of only Taiwan and far behind South Korea and Japan. Particularly evident is Hong Kong with the highest prices for 'high-speed mobile pricing' (which as Mr. Au

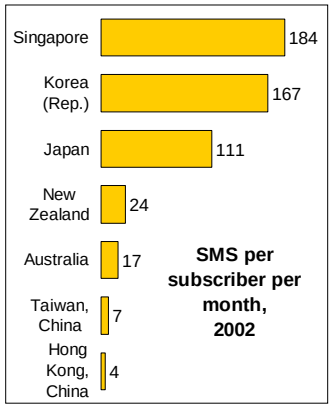
indicated should drop dramatically in a highly competitive 3G network environment) and the lowest level of internet penetration for mobile phone subscribers – for the entire Asia/Pacific region.

The following slides are from an ITU study and presented in 'Measuring the Mobile Internet' which was presented at the Pacific Telecommunications Council meeting in January of 2004.

These slides capture comparisons, particularly between Hong Kong, Japan and South Korea, which are directly relevant to the need for maximum high-speed mobile wireless services deployment in Hong Kong if the benefits of 2G liberalization are to be replicated.

Text messaging

- Not mobile Internet
- Most intensely used non-voice mobile application
- Possible indicator of potential mobile Internet use
  - Number of messages
  - Penetration (i.e., % of subscribers that use it)
- Wide variation in region
  - Definitions? (e.g., sent & received, 'junk' SMS, etc.)

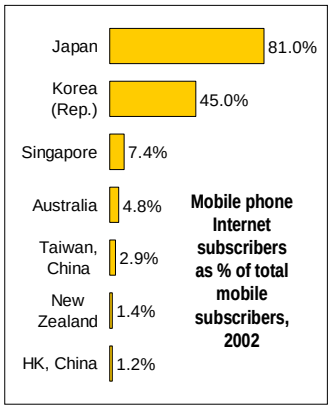


Note: SMS = Short Message Service
Source: ITU adapted from various reports.

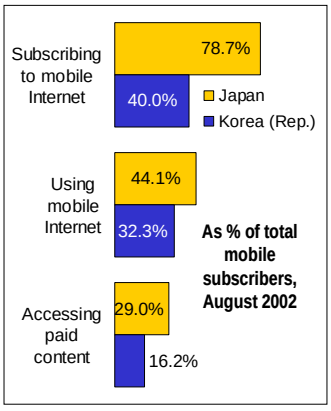
The low voice prices in Hong Kong, which are due to the high degree of competition, result in very low interest in SMS

Mobile phone Internet subscribers

Subscribers browsing the Internet from their mobile phone (e.g., Wireless Access Protocol (WAP), i-mode)



Source: ITU adapted from various sources



Source: ITU adapted from Nomura Research Institute & Korea Network Information Center

Of particular interest from the ITU survey results is the substantial difference between 'subscription' and 'use' of mobile internet. The subscription data should coincide with operator statistics but the 'use' category is more directly related to policy concerns.

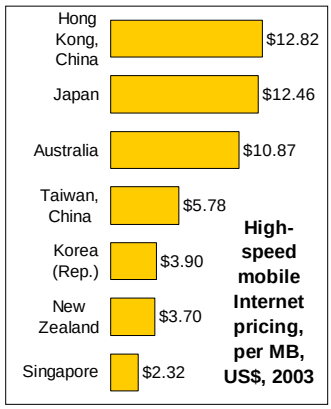
It is important to note that the statistics are for the year 2002, prior to the introduction of 3G services in Hong Kong – which are at present just beginning to become available – but during the early phases of availability in Japan and Korea.

High-speed mobile pricing

1 Megabyte (MB) is approximately equivalent to:

- 250 emails (of 200 words)
- 20 emails with attachments
- 20 pages of spreadsheets
- 10 web pages

Source: Telstra

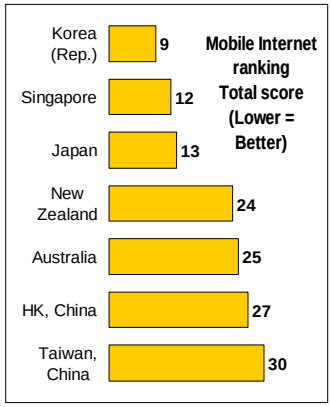


Source: ITU adapted from various sources.

The lack of 3G services in Hong Kong at the time of the survey indicates that in addition to high prices, there was a general unavailability of mobile high-speed services that would be convenient to consumers.

Mobile Internet Index

- Which economy is doing best overall in mobile Internet?
- Helps to overcome limitations of different data by using a number of variables
- Indicators:
  - Mobile to Internet Ratio
  - SMS/sub/month
  - Mobile telephone Internet users ratio
  - High-speed mobile subscriber ratio
  - Mobile data revenue ratio
- Mobile Internet Divide



Source: ITU.

MARKET DYNAMICS

A standard approach to examining market operation is the Structure – Conduct – Performance model.

This approach examines how the:

- **structure** (i.e., the number of players and networks, the degree of competition as indicated by market concentration and the variety of services available in the market) affects the

- **conduct** (i.e., pricing, network investment and rollout) which in turn relates to

- **performance** (i.e., economic efficiency metrics such as static efficiency – the relation of prices to costs – and dynamic efficiency – the rate of technological innovation).

It is the role of public policy to set the appropriate regulations that result in the maximum efficiency generated in the market, both static and dynamic. In a highly competitive industry, economic theory demonstrates that market prices will closely approximate the costs of production. This circumstance maximizes the level of production (i.e., level of use of services) so that consumers have available the largest economically feasible amount. The economic literature is also clear concerning dynamic efficiency. Nobel Laureate Kenneth Arrow – supported by numerous econometric studies – has demonstrated that a competitive market is superior in generating innovation.

A Merrill Lynch Report [The Next Generation of Wireless VII – Feb 2003] clearly demonstrates that, in comparing the highly competitive U.S. 2G mobile market to that of Europe, which is much less competitive, a comparison of average consumer usage is 'staggering with MOU of 439 in the U.S. compared with 114 in Europe' for 2002. In fact, for the six national carriers, the figure is even higher at 483. Even adjusting the European figure by 20% – according to Merrill Lynch – to reflect the calling party pays U.S. model, the U.S. usage statistics still far exceed the European. Additionally, according to Merrill Lynch, the more competitive U.S. market has less under-utilized capacity than the average European carrier and – importantly for innovation – a higher capex/sales ratio.

Asian data also reflects the impact of enhanced competition on consumer use of mobile networks. Statistics conform to the SCP model – as for the U.S./European comparison – even with the introduction of 3G services in Japan and Korea in 2002. Hong Kong's greater degree of competition generates a much higher customer voice use than the other countries – 88% higher than Korea and 343% higher than Japan. Additionally the rate of growth – as well as in growth of actual number of minutes – is higher in Hong Kong than for either country.

The following table presents the average MOU statistics for the three markets considered.

	December 2003	December 2002	Growth Rate
Hong Kong	570	500	14%
Japan	166	159	4%
Korea	302	279	8%

Source: EMC Worldwide Cellular Database

The SCP model provides an excellent logic to examining the licensing issue facing OFTA.

It should go without saying that an earlier rollout of high-speed mobile wireless services networks is preferable to a later rollout in terms of consumer benefit. Tele-communications, as a network industry, has demonstrated 'network externality' effects reflecting the desirability of consumers to be part of a network that provides connectivity – for a set of services – to other consumers. Metcalf's Law, which states that the value to a consumer of such connectivity increases exponentially with the size of the network, is the epitome of such externalities.

It could be argued that some portion of the success of mobile data customer sub-scribership and use in Japan and Korea is due to such network effects. Particularly with 3G data services that are related to availability of content and applications, more and larger networks and the supporting content and applications development can in turn create additional value for a marginal customer.

In Hong Kong's particular circumstances, this impact of an additional network should be pronounced given both the additional level of competition, as demonstrated in the 2G experience, as well as the assignment of spectrum in the 800 MHz band. The lower network costs at this band, in relation to the higher frequency bands assigned to the current 3G licenses, provides an ability to rapidly deploy and offer service. This is, as noted, particularly so if the licensee has existing infrastructure that can easily be upgraded to high-speed mobile wireless service operations. Such entry would dramatically impact the 'conduct' of the industry overall

THE HONG KONG DATA SHORTFALL

As noted by OFTA and the ITU, the availability of mobile data services in Hong Kong is currently quite limited. This fact, however, indicates that there is a substantial potential for market growth and operator revenues. Hong Kong's experience with 2G services bears witness to the possibilities that exist – especially when contrasted with forecasts made at the time. However, there are international comparisons that can serve as benchmarks for minimum levels of market size in Hong Kong for 3G services. As seen for 2G services, Hong Kong's highly competitive market can generate results far in excess of less competitive markets.

OFTA has noted that one Japanese mobile operator has over 4,000 web sites accessible to its subscribers and there are over 70,000 sites accessible in total. As

Mr. Au notes, ‘this is in stark contrast to the number of sites accessible to Hong Kong mobile customers…’.

The ITU statistics presented earlier indicate why this is so.

With these high prices, it is no surprise that the penetration of internet subscribers among all mobile users has Hong Kong placing last among developed economies in the Asia/Pacific region.

OFTA, using operator statistics, estimates that there are as of February 2004 almost 964,000 ‘2.5G’ customers which represent 13.3% of all mobile customers. In contrast, OFTA notes that in Japan the penetration rate for mobile internet is 90%.

Merely standardizing to the Japanese rate in Hong Kong indicates that 6,500,000 mobile customers could be expected to use internet services, an increase of 676%.

An alternative measure of potential growth is to examine new ITU survey data on the ‘use’ of mobile internet relative to penetration of mobile internet in Hong Kong and South Korea for 2003 with 2002 data for Japan. As noted earlier, the ‘use’ rates are lower than operator reported ‘subscription’ rates.

The ITU survey statistics on the ‘use’ rate of operators (Japan for W-CDMA and CDMA 1X and Korea for CDMA 1X and EV-DO) to approximate the growth potential of the mobile data market in Hong Kong:

Market	ITU ‘Use’ Rate as % of total mobile customers	Mobile Internet Penetration Rate
Hong Kong [2.5G]	2.1%	13.3 % – Operator Data
Korea	36.1%	59.8%
Japan	44.1%	78.7%

In the first instance, it needs to be noted that the above statistics are essentially demonstrating phenomenal first year adoption rates of 3G services in Japan and Korea.

In Korea, CDMA2000 1X was only introduced in early 2001 and within two years over 36% of customers had actually used high-speed mobile wireless services. In Japan, NTT DoCoMo initiated W-CDMA service between May of 2001 and April of 2002 while KDDI introduced CDMA2000 in September of 2002. Yet by the end of 2002, over 44% of Japanese mobile customers were using internet services.

Between 2002 and 2003, the ‘use’ rate in Korea grew by 11%. Comparable data for Japan is unavailable, but given the similarity of development in the two markets, it is reasonable to expect comparable growth.

As noted in the Spectrum Strategy Report, the higher degree of competition in Hong Kong has led to a much higher penetration rate of mobile services than in either Japan or Korea.

	Mobile Penetration Rate – 2002
Hong Kong	91 %
Japan	62 %
Korea	67 %

This higher degree of competition, if extended to the high-speed mobile wireless services market by licensing a 5th network by OFTA, should generate comparable consumer benefits in both penetration rates and use as availability leads to lower subscription and usage charges.

Accordingly, it is reasonable to assume some proportionality between the penetration rate and the percentage of mobile customers actually using internet services, once these services are available under competitive conditions.

The ITU survey statistics on 'use' for Japan and Korea – even in the early rollout period (as presented above) – permits estimates for use of high-speed mobile wireless services by customers in Hong Kong. The following table utilizes the Hong Kong penetration rate for 2003 for consistency, not the current rate of 107.9%.

	Hong Kong Penetration Rate/Country Rate	Country Mobile Use Rate	Projected Hong Kong Use Rate
Japan	1.46	44%	64%
Korea	1.35	36%	49%

Accordingly, assuming that the Hong Kong 3G market is approximately as competitive as its 2G market, and assuming the number of customers remains at the February 2004 level of 7.241 million, it can be expected that – within the first 2 years of widespread service – there would be between 49% and 64% mobile use which corresponds to a customer base of between 3.5 million and 4.6 million.

Obviously, higher penetration rates for mobile (as recently released), population growth and increased roaming will add to this customer base. Further, it is unlikely that the mobile use rates for Japan and Korea surveyed by the ITU – just 2 years into the full rollout of 3G – represents the maximum that will be achieved, so that this range of 3.5 million to 4.6 million is, in all probability, highly conservative.

CONCLUSION

The licensing policy adopted by OFTA in the 2G era has resulted in the most competitive mobile market in the world with current penetration rates at 107.9%. Additionally, average customer use for voice service greatly exceeds that in the United States, Japan, Korea and European countries.

This high degree of competition has brought substantial benefits to consumers, both residential and business users alike, and in doing so has strengthened the overall Hong Kong economy and made it more attractive to industries that are heavy telecommunications users.

These benefits have flowed, as would be expected, from a high degree of network competition even though that competition has resulted in some consolidation in the industry – yet generating positive value for operators due to the high usage rates of the large number of users, factors that bode well for 3G application and content development.

TMG believes that these same benefits can accrue to the mobile data sector, the one area which has not yet benefited from substantial competition.

The forecasts of mobile use made around the time of the additional 2G licensing demonstrates the difficulty – with a new, developing technology – of any regulator trying to second guess the market and OFTA's approach of permitting maximum entry and then allowing market forces to operate has clearly been a resounding success.

The same approach should be adopted with respect to the high-speed mobile wireless services market.

Additionally, as OFTA has it in its power to accelerate the rollout of high-speed mobile wireless services for existing licensees that already have infrastructure in place, OFTA should give serious consideration to the license conditions that would permit an offer of the 'right of first refusal' to all current licensees, not merely the GSM and PCS licensees.

www.tmgtelecom.com