



Telecom Infotech Forum

Big Pipes, Big Dreams or Little Nightmares? Bandwidth Capacity in Hong Kong

Tuesday, 18 September, 2:00-2:30

Panel One

1. Hong Kong's Role as a Hub and the Future of Licensing Policy

M.H. Au

Deputy Director-General, OFTA

2. Breathing Oxygen into International Services?

Terry O'Neill

Director of Business Development, CLP TeleCom

3. Bandwidth in the Asia-Pacific Region: How Competitive is Hong Kong?

Ross O'Brien

Research Director of Strategic Intelligence

Panel Two

Brain's Trust of Big Carriers in Hong Kong Plus a Representative of the Hong Kong Telecommunications Users Group

Speakers

Question Master: David Warner, Telecoms & IT Consultant and HKTUG Exco

Panel:

Tom Boasberg, Level 3

Dermot Keilthy, Reach

Kelvin Law Teleglobe

Ted Ringrose, Worldcom

Simon Chan, HKTUG

Executive Summary

1. Bandwidth coming into Hong Kong by submarine cable or by satellite is the lifeblood of Hong Kong's role as the premier telecommunications hub in East Asia. In 1998 the exclusive licence of Hongkong Telecom International (HKTi) was terminated by agreement and the four fixed telecommunications network service (FTNS) licence holders were each awarded the right to own and operate international gateway facilities (IGFs). From January 1999 international simple resale (ISR) was introduced along with the issuing of external telecommunication licences (ETS) to virtually anyone who wished to lease circuits from HKTi and resell them. Since then HKTi has been renamed Reach, as a joint venture between PCCW and Telstra, and since January 2000 additional external FTNS licences have been issued to carriers bringing significant cable or satellite capacity into Hong Kong. However the moratorium on the issuing of new domestic FTNS licences means that External FTNS licence holders must lease wholesale circuits for backhaul and access to their local customers. These wholesale prices add significantly (30%-40%) to the total cost of international traffic from Hong Kong. (See the Background Briefing Paper).
2. Our first speaker, **M.H.Au, Deputy Director-General of OFTA**, made the point that a Consultation Paper would be issued soon addressing these remaining restrictions. [*The CS was issued October 2001 and proposes to liberalise the market completely from January 2003 upon the expiry of the FTNS moratorium – JU*]. Every economy in the region claims it wants to be a hub, but in Hong Kong's case that has been true for telecommunications and to some extent for broadcast content and transmission also. M.H.Au referred to the Government's commitment to keeping it that way, pointing to the competition clauses in the newly enacted Telecommunication and Broadcasting Ordinances. Hong Kong does not have a Competition Law as such, but does incorporate competition policy in these two sectors. Nevertheless, OFTA's commitment to light-handed regulation continues. The question for the near future is whether total market liberalization will require a rethink of the approach to regulation, no doubt a future topic for TIF. Whatever the answer, M.H. reiterated the principles of transparency and predictability as guidelines for any regulatory regime if investment was to be attracted to Hong Kong and fair treatment was to be assured.
3. M.H.Au made the important distinction between four types of bandwidth capacity: for cable systems (a) the ultimate capacity of a fully lit fibre, (b) the initial capacity expressed as the data rate achieved through a fibre, and for individual countries (c) the currently equipped capacity of the fibre, and (d) the activated capacity. Hong Kong had an initial capacity of 44 gigabits prior to liberalization which has increased tenfold since liberalization. (See accompanying charts). Policy must be directed at increasing equipped and activated capacity. In this regard, **Terry O'Neill, Director of Business Development, CLP TeleCom**, represents a new entrant, China Light & Power, that has recently invested in 1 x 2.5 Gigabit cable from Hong Kong to mainland China. Terry points out that of the 480 gigabytes per second equipped capacity in Hong Kong only 37 Gbps cross the border. Clearly, the potential for Hong Kong – mainland traffic is enormous, especially traffic associated with what was recently termed 'The New Economy' but what CLP TeleCom prefers to call 'The Networked Economy'.
4. Fundamental to TeleCom's approach is the provision of broadband using IP that allows multiple devices to provide customers with a flexible range of services and delivery options. This strategy then, in Terry's words, "allows the network operator to function separately from the service provider." Not all customers are looking for end-to-end services, but they are looking for a depth of services, or a suite of service offerings rather than simply a voice line or a fax line. Some customers will be looking for transit through

Hong Kong to mainland China rather than transoceanic connections. TeleCom in this sense represents a modern trend for smaller new entrants that offer bandwidth for tailored services to a range of customers with specific individual needs.

5. This point was emphasised by **Ross O'Brien, Research Director of Strategic Intelligence**. He makes the point that although there may be excessive bandwidth capacity as a result of the cable investment boom which recently came to an abrupt pause, it would be wrong to conclude that bandwidth has therefore achieved commodity status. Rather, bandwidth remains largely location-specific and turning capacity into a business will stimulate niche market approaches like TeleCom's. Ross points to the very uneven level of supply as well as demand across Asia, which belies the commodity analogy. So does the fact that IPLC prices only go down (all speakers agreed that prices had fallen at least 50% over the past 12 months alone) whereas typical commodity prices move in both directions. Only on certain routes, from example New York – London, is capacity widely and successfully traded. In fact, IPLCs between the two regional hubs of Hong Kong and Singapore remain among the highest.
6. Ross reminds us that besides South Korea, Hong Kong is really leading the adoption of broadband for Internet usage in Asia and the only qualification is that Hong Kong remains a small marketplace. But as a transit point Hong Kong opens up a big marketplace.
7. The second session consists of a panel representing major carriers, **Tom Boasberg of Level 3, Dermot Keilthy of Reach (joint venture between PCCW and Telstra), Kelvin Law of Teleglobe and Ted Ringrose of Worldcom, with Simon Chan of the Hong Kong Telecommunications Users Group** that represents major users in Hong Kong. Acting as question master is **David Werner**, previously in charge of telecommunications services with Hongkong Land Ltd, an executive committee member of HKTUG and now a private consultant. Between them the companies represent two traditionally established all-service carriers (Reach and Teleglobe) and two relatively new entrants (Level 3 and WorldCom) who specialise in the ISP/IAP/ICP and the corporate markets respectively.
8. Despite the frustrations that foreign carriers still have in Hong Kong having to buy wholesale circuits for backhaul and local access, which adds to cost as referenced in (5) above, they all consider Hong Kong as outstanding in terms of regulatory transparency and the level of understanding of the issues locally. And they all make the point that although Hong Kong is a small market, it's also a market that works dynamically.
9. Part of the discussion focused on the economics of building modern fibre cable networks and lighting them. Technological advances are now so rapid that the theoretical capacity of a network is little more than propaganda. As the marginal costs of lighting a network are low compared to the building costs it makes sense to lay large capacity and light it as you go, paying for line equipment from current business revenues. (And for that reason, it was easy to exaggerate the idea that capacity was in over-supply.) The caveat is that the capital glut has turned into a capital scarcity since 2000, and even if Hong Kong liberalises totally from January 2003 the investment boom may not reappear. The industry will be less supply driven and more demand constrained, so much of the discussion focused upon future sources of demand.
10. On the demand side it was pointed out that major users were not, generally, high consumers of content and multimedia applications, rather they placed a high demand on reliability and network integrity. Thus, it was still the case that major users choose carriers by reputation rather than networks for their technical offerings. Content and applications were seen as the potential of the mass consumer markets, but constrained by numerous factors. No-one really seemed to have a clear vision as to which of these two broad market segments would grow the fastest.

11. On the regulatory side there was wide agreement that opening the domestic market to backhaul and local access facilities was an inevitable, not to say overdue, measure. OFTA made a plea for more input into the consultation process on these issues from the industry across the board. OFTA also pointed out that it had added resources to tackle the issues of a totally open market, including creating the post of Deputy Director General, and setting up a Competitive Affairs Branch.

12. Inevitably, much of the questioning also focused upon the China market, not yet open but with WTO membership due shortly this will begin to change. With China's economy emerging as a twenty-first century powerhouse it is important both for China and the region that plenty of bandwidth is available in and out of China. In the past 18 months the number of international cables has jumped from two to five or six. This adds urgency to Hong Kong's ability to cater for this traffic for direct connectivity and for transit. On a broader level, as the international accounting rate system disappears into history, the half-circuit regime is being displaced by end-to-end networks, mostly across to the USA. However the emergence of regional networks is beginning to be seen in tandem with regional joint ventures and investments, a process that will accelerate as Asian content and applications fuel intra-Asian Internet traffic. PCCW, Telstra, SingTel, NTT recent examples of regional expansion. Will they form alliances with the major carriers like Teleglobe, WorldCom, Level 3, AT&T or will they become masters of the region? And how well positioned is Hong Kong to remain at the centre of this new regional market for telecommunications? Key questions for the future.

Apologies to readers, speakers and participants for the problems that arose in the transcription of the audio during the session. The transcription was done remotely on this occasion, and it clearly did not work well. Where necessary short summarises have been included.

Jim Ogilvy Stuart: I'm General and Branch Manager of Bloomberg Hong Kong, responsible for our business here, not just in Hong Kong but in Greater and Mainland China, in Korea, in Thailand and in the Philippines. I would like to start by just saying a few words of apology if you have suffered any kind of inconvenience in getting through to this room. For what I think are very obvious reasons, we have, in line with many other companies here in Hong Kong, slightly revised and upgraded our internal security measures, so thank you for bearing with us on that one.

This afternoon's event is certainly not a platform for me to really take up too much of your time, so I will keep my few words of introduction very brief. I do, however, think that the topic for this afternoon is an especially interesting and timely one. We here at Bloomberg, and in Bloomberg worldwide, are extensive consumers, eaters of bandwidth. We spend many hundreds of millions of US dollars a year maintaining our own internal telecommunications infrastructure. We are very large consumers and we are large consumers because people who connect to our network to retrieve data and financial news and information and to perform analytics need, themselves, to utilise a great deal of bandwidth to access our service and to get the maximum benefit out of it.

Technology is enabling us all to do some fairly exciting things these days. We have the facility to provide streaming videos to our customers on archived recordings of interviews that have taken place in our TV studios here. We provide some fairly detailed technical spreadsheeting capabilities which enable people to look real time at many hundreds of different securities and different financial instruments, traded across markets. All of these things are bandwidth intensive. We are ourselves going through an exercise to persuade all our customers here in Hong Kong and elsewhere in the world to upgrade from what used to be a 64 kilobit connection to T1 to E1 circuits, all because the more intensive and the more dense, if you like, the functionality that we provide to our customers, the more the demand on bandwidth. So I certainly will be very keen to get feedback from this afternoon's event. Given the fact that this room seats about 150 people and is pretty much full, it's clearly a very timely topic and one of considerable interest. Really, on that note, I think that's enough of me. I will hand you back and thank you again for using our venue this afternoon. Thank you.

John Ure: Jim, thank you very much indeed and a special thanks again to Bloomberg for making this really splendid auditorium available to us and I would also like to extend the thanks to Han Chan of Bloomberg who helped us organise the event and to Sam who is helping us operate the audio visual.

Firstly, for those who don't know me, my name's John Ure, the director of the telecoms research project and of the forum here. We hold this forum on a quarterly basis and many of you have been before but I can see quite a few new faces as well, so welcome to all of those of you who haven't been before.

The format is as informal as we can make it. We'll have three presentations in the first panel - quarter of an hour each presentation - and that will be followed by Q and A. And in the second panel we will go straight into a Q and A with representatives of various carriers and David Werner from the Hong Kong Telecom Users Group will be acting as a question master during that session, so please do throw out as many difficult and awkward questions as you can think of.

This event marks two anniversaries. The first, sadly enough of course, is it's exactly one week ago since the atrocity took place in New York and Washington and we're very mindful of that event and, of course, including Hong Kong people that might have perished in it. So our heartfelt sympathies go out to all those involved.

The second anniversary is that about a year ago we had a meeting here led by Professor William Melody about 3G and it was very much out of that meeting, I think, that there was a bit of a turning point in the debate that took place in Hong Kong. At that time, a lot of people were just looking for the success, as many people saw it, of the auctions in Europe, thinking that we should go for the same thing here. And I remember, among others, Emily Lau (a prominent Hong Kong Legco member – ed.) actually standing up at this forum about one year ago saying that she was having second thoughts as a result of attending the forum because she realised it was now more complicated an issue than had first occurred to many LegCo members. So that was a very important event and I would like, in that context, to thank Mr M H Au, the deputy director of OFTA, very much for sparing us the time today because today is, in fact, the day that OFTA is doing the pre-qualification assessment of the potential bidders. I am sure that you would like to ask any questions on that issue, and I am sure he won't answer them, but do your best if you like. But we've specifically asked M H to give us a view about the impact that OFTA's policies have had on bringing additional bandwidth to Hong Kong and what that will mean for Hong Kong, especially as a hub, and what OFTA's policies are towards future licensing of external and local FTNS operators. I think that will be very interesting to hear those views.

M H will be followed by Terry O'Neill from CLP Telecom. Terry is standing in for Peter Heavyside who had to be in Taiwan, I believe, today, so thank you again very much for standing in, Terry. And of course CLP Telecom is particularly interesting as a new entrant in this field and so, again, Terry, I am sure, will have some rather interesting insights from a non-traditional carrier perspective.

And, thirdly, Ross O'Brien from Strategic Intelligence. I have known Ross for a number of years. He has done some very interesting work in this area and on the basis of his research he's going to give a Hong Kong perspective, but within the context of the region and what's happening in the region.

So I think the presentations we're going to hear will be a good foundation for the question and answering session of the second panel. Before I invite M H to make the first presentation, can I just remind members of the press and media of the house rule and that is that if you wish to quote or directly attribute a remark to anybody you are requested to ask the permission of that person. I am sure in most cases there will be no problem but it does preserve a little bit of anonymity for those people who want it and, again, just to remind you please all wear your name tags at all times. So, perhaps M H, could I invite you to give us OFTA's views on this subject?

M.H. Au: Thank you, John, for the introduction. Good afternoon ladies and gentlemen. This afternoon I am going to give you a short presentation on Hong Kong's status as a regional telecommunication hub and the future of our liberalisation policies in the external facilities market. I will try to keep it short so that we will have ample time for questions and answers and discussion.

Now, Hong Kong has become a hub. I think you all know that one of our major policy objectives in Hong Kong is to make Hong Kong the regional hub for not only telecommunication traffic but also content. That will make Hong Kong the preferred city for multi-national corporations for their world or regional headquarters and that will also promote investment in Hong Kong and generate sharper facilities.

So, how do we go about achieving our policy objective? Well, Hong Kong, or the government, does not invest in the telecommunications sector so these are the approaches that we have adopted - we'll liberalise the market, remove obstacles, remove as far as possible entry barriers. We don't have any foreign ownership restriction for our telecommunications operators. We promote fair and effective competition, although in Hong Kong we don't have a general competition law or a general competition authority. Telecommunications is one of the two sectors, the other one being broadcasting sector, where there is actually fair competition conditions in the legislation and the Telecommunications Authority is responsible for enforcing those conditions. So making sure that we provide a fair environment so that investors are able to recoup a reasonable return on the investment that is commensurate with the risk of the investment that would create a conducive environment for people to come into Hong Kong and invest in the infrastructure. And we rely on market forces to the maximum, so we do not lightly intervene in the market. So, for example, terms and conditions of interconnection are left to be decided by commercial negotiation and we will only intervene if commercial negotiations cannot result in an interconnection agreement.

So this is the basic telecommunications policy of Hong Kong and that is applicable in all sectors of the telecommunications industry - the local fixed sector, the mobile sectors, as well as the sectors all providing international bandwidth and international capacity. And you might recall that only five years ago we still had the exclusive licence, at that time held by Hong Kong Telecom International, and if the government didn't do anything at that time, they would still have an exclusive licence today because that exclusive licence would not expire until the end of September 2006. The government has perceived that this continued existence of the exclusive licence would put Hong Kong at a seriously disadvantageous position and therefore the Government took the initiatives of negotiating with Hong Kong Telecom to end the exclusive licence fairly and there was the agreement of the compensation - HK\$6.7 billion in 1998. And the result of this negotiation has enabled external services competition from January 1999 and external facilities competition from January 2000.

The impact of services liberalisation, I think, is well recognised and because this afternoon we are going to talk about international capacity, I shall not dwell too much on the services competition.

Facilities competition started less than two years ago, from January 2000, and this has already led to substantial investment in submarine cables and overland cables. Now we have competition, we have a multitude of operators who compete to get facilities and capacity in Hong Kong, and prices have fallen substantially - I would say at least 50% - since the liberalisation of the facilities market since January 2000. There is an additional margin for prices to fall and this is all for the benefit of the users.

Before liberalisation, at that time we had some arithmetic, the total capacity - adding up all the capacity of submarine cables landing in Hong Kong - at that time was 44 gigabytes per second and these new cables ensure that the operators of these cables are all here. This is just the initial capacity and the overall capacity in Hong Kong with these four cables landed and equipped to deliver the initial capacity will increase Hong Kong's overall capacity by at least ten-fold. And those were the submarine cables - and overland cable the same phenomenon also, of course. New cables are going into Mainland China and these capacities are just initial capacities only, if someone understands them. These cables typically will have 16 pairs or 24 pairs.

Now, we are talking about Hong Kong's place in the competition as a regional telecommunications hub. Of course, we must recognise that Hong Kong has to compete

with neighbouring cities, neighbouring economies, in getting this position and nearly all submarine cable systems are landed in a number of places, not just Hong Kong, and it can be illustrated by this table. So, for example, when you look at submarine cables they have a landing point in Japan, probably because Japan happens to be a very geographically advantageous position, now all the trans-Pacific cables actually originate somewhere in Japan. So, we have to compete with all these neighbouring territories and cities and we have to distinguish several types of capacity or several categories of capacity, so we shouldn't be dismayed by just summing up all the capacity of cables coming into Hong Kong.

I have identified here at least four types of capacity. First of all in a cable system, the submarine cable system, we are talking about the ultimate capacity. A typical submarine cable will have many pairs and each pair are multiplexed. They use an intense wavelength. If it is multiplexed they can put different wavelengths in the same optical fibre, so there is an ultimate capacity. But initially, because of the American situation, probably they will only link up the optical fibre cable using a limited number of wave lengths, so we have the initial capacity.

And then this is just the data rate, the rate of data flow in the submarine cable system and because all the submarine cable systems are actually physically operating in a loop and landed in several countries, several cities, so for each individual country or individual city we must look at the equipped capacity and the activated capacity. These are the two terms used at the OFTA's website. Equipped capacity is actually the capacity of equipment, which is readily available, which has been installed readily available to deliver capacity in and out of Hong Kong, to users in Hong Kong. And the activated capacity in our website is the capacity which, today, is being used. Maybe your circuit already leads to an end customer.

So our policy here, of course, we have to promote the landing of submarine cables in Hong Kong. If you do not have a cable actually having a landing point in Hong Kong, you cannot talk about equipped capacity and activated capacity. But landing a cable here is not sufficient. We have to encourage the equipped capacity and activated capacity in and out of Hong Kong and all this data that has to come into Hong Kong and get out of Hong Kong. So, in competing with the other territories and countries, we have to build on our strength. We have to understand our edge.

How do we encourage people to come into Hong Kong and to bring the capacity of the submarine cables into Hong Kong? Now, in Hong Kong, of course, we have a demand generated by our position as a regional financial and commercial centre. Hong Kong, by and large, is populated by a relatively wealthy and computer literate population. They readily accept new technology and this, of course, will also generate a demand.

I think, one of our edges is that we have a transparent and predictable regulatory framework, so outside network investors know Hong Kong. They basically understand the Hong Kong framework and they can predict how the Hong Kong framework works. When they have a question, they can almost guess the answer themselves because our framework has been published and we abide by the rule of law, so this is transparent and predictable regulation.

And we have liberalisation. I am not claiming that we have full liberalisation today, but I am going to explain how we are going to further our liberalisation effort. Hong Kong does not have much regulation on content and the operation of data centres in Hong Kong require no licensing. The Hong Kong population is of course familiar with the Chinese language and how the Chinese market works, so Hong Kong will be an ideal location for any content and data to serve China. This creates an incentive to bring capacity in the submarine cable systems into Hong Kong.

So, what are we going to do in the coming years? For those who are familiar with Hong Kong's regulation, you might be aware that in 1999 there was a review of the fixed network licensing policy and as a result of that review there was a moratorium on the licensing of fixed telecommunication networks, including further licensing of wire line based local fixed networks and certain restrictions for entry into the external facilities market. As of today, you have to invest in a new cable. You have to be the direct investor in a new cable before you are entitled to get the licence for extended facilities in Hong Kong.

Not any more. After 1 January 2003, from that point onward the external facilities licence can be based on IRUs on existing cables, or new cables, and we propose that from 1 January 2003 there will be no restriction on external facilities operators to build a backhaul.

And also the question of restricted direct access to customers because not many external facilities operate effectively. They prefer to provide services to end customers, on an end to end basis, and then as a result of lifting the moratorium on local fixed wireline licences from 1 January 2003, they can actually build the last mile to the customers. And there will also be a question of the extent of preparatory work permissible prior to 2003, because the liberalisation commencement will be 1 January 2003. Any licence we issue will have to be effective from 2003.

The question is what sort of preparatory work can be done in 2002? Do they have to wait until 2003 before they can dig up the road, lay the ducts, or lay the fibre? Or can some sort of preparatory work be done in 2002 so as to enable them to roll out the network and commence their services as soon as possible? All these services are broadly covered in an industry consultation paper to be issued soon and the present plan is that after the industry consultation we'll listen to the views of the industry, take a decision towards the end of the year and the licences will be issued first quarter of 2002. Of course, because of the moratorium, the effective date can not be earlier than 1 January 2003.

So to continue my short presentation, market liberalisation policy in the past has already established Hong Kong's position as the regional telecommunications hub, but we must remember that our competitors are catching up. Singapore - originally they were not to open up their market until April 2002 - has with a big bang brought forward full liberalisation to April last year. Japan is fully liberalised. Australia fully liberalised. Mainland China is going to join the WTO end of the year. Even Taiwan is also opening up. So our competitors are catching up, so we must ensure that our policy can maintain and enhance our position as the regional telecommunications hub. We must maintain and enhance our competitive edge.

Thank you very much.

Hong Kong's Status as a Regional Telecommunications Hub and Liberalization of External Facilities Market

M H Au

Deputy Director-General

Office of

the Telecommunications Authority

Our Policy Objectives

Among other things

- To consolidate and enhance Hong Kong's position as a regional telecommunications and Internet content hub

Our Approach

- Provide a conducive environment for investment by private sector
 - **Market liberalization**
 - **No foreign ownership**
 - **Fair competition**
 - **Light-handed regulation**

Market Liberalization for External Communications

- Original exclusive licence to last until end-September 2006
- Negotiation with Hong Kong Telecom for early termination from end-March 1998
- Compensation to Hong Kong Telecom: HK\$6.7 B in 1998
- External services competition from Jan 1999
- External facilities competition from Jan 2000

Market Liberalization for External Communications

- IDD price reduction as a result of services competition from Jan 1999 is well recognised
- External facilities competition from Jan 2000 has led to significant investment in new submarine and overland optical fibre cables and substantial reduction (at least 50%) reduction in prices for international private leased circuits so far

External Communications (Cont' d)

- Before external facilities competition, total submarine cable capacity available to Hong Kong was 44 Gbps
- New submarine cables landed or about to land to add 480 Gbps initial capacity:
 - **East Asia Crossing (1Q 01) 80 Gbps**
 - **APCN2 (3Q 01) 80 Gbps**
 - **C2C 160 Gbps**
 - **Flag/Level 3 80/80 Gbps**

External Communications (Cont' d)

- New overland cables to Mainland
 - **Second fibre ring (June 2000) 5 x 2.5 Gbps**
 - **Third fibre ring (1Q 2001) 3 x 2.5 Gbps**
 - **China Unicom fibre ring (December 2000) 4 x 2.5 Gbps**
 - **China Netcom/Far East Gateway cable 2 x 2.5 Gbps**
 - **CLP Telecom cable 1 x 2.5 Gbps**

Note: All initial capacity only

Multiple Landing Points for Submarine Optical Fibre Cables

	Hong Kong	Singapore	Taiwan	Main-land	Japan	South Korea
APCN	X	X	X		X	X
FLAG	X			X	X	X
SEA-ME-WE 3	X	X	X	X	X	X
FLAG/Tiger	X		X		X	X
C2C	X	X	X	X (planned)	X	X
EAC	X	X	X		X	X
APCN2	X	X	X	X	X	X

Different Meanings of Capacity

- Cable systems
 - **Ultimate capacity**
 - **Initial capacity**
- Individual countries
 - **Equipped capacity**
 - **Activated capacity**
- Apart from increasing capacity available from cable systems, policy must promote equipped capacity and activated capacity in/out of Hong Kong

Hong Kong's Edge

- Demand generated by position as financial and commercial centre
- Relatively wealthy and computer literate population
- Transparent and predictable regulation
- Market Liberalization
- Minimal regulation on content/data centre
- Familiarity with the Chinese language and environment

Further Liberalization Initiatives

- Full liberalization from 1 January 2003
- At present, new External Facilities Licence cannot be based on Indefeasible Right of Use (IRU); such restriction to be lifted upon full liberalization
- External facilities operators may build their own “backhaul” from 1 January 2003

Further Liberalization Initiatives

- Direct access to customers - further liberalization of local fixed network market
- Extent of preparatory work permissible in 2002
- Issues to be covered in an industry consultation paper to be issued soon.
- Invitation of licence applications before end 2001. Licences issued Q1, 2002 to be effective from 1 January 2003

Conclusions

- Market liberalization policies in the past has establish Hong Kong position as a regional telecommunications hub
- Hong Kong's competitors are catching up
- Hong Kong must pursue policies that maintain or enhance our competitive edge

Office of the Telecommunications Authority (<http://www.ofta.gov.hk>)

18 September 2001

Telecoms InfoTechnology Forum

John Ure: Thank you very much MH. MH is able to stay until we have the coffee break so we can go on to our second and third speakers and then we'll take questions to all three speakers. So Terry O'Neill if you'd like to come up and tell us how you're breathing oxygen into the international game.

Terry O'Neill: Good afternoon ladies and gentlemen. If you didn't catch what John said, my name is Terry O'Neill. I work for a company called CLP Telecom. Very, very briefly, if you don't know who CLP Telecom is, I formally suggest that you must get your electricity from this side of the harbour. Celebrating our centenary this year - 2001 - so, very much in the old economy. We do own the largest electricity utility in Asia, outside of Japan - CLP Power. - and as part of that company we do have about 1.9 million customers in Kowloon, and the New Territories. We also have relationships with utilities on the Chinese mainland and we also have strategic interests in the rest of Asia.

I have to apologise to Mr Au at this point. This is a straightforward copy of one of his slides and I've copied it because, quite frankly, it's a very accurate depiction of the situation as of today. The IPLC market, as I am sure you will all testify, the bottom has dropped out of it. A tremendous amount of competition. A tremendous amount of price reductions available on all significant routes into and out of Hong Kong. The introduction of external facilities competition in Hong Kong has led to a dramatic decrease in the price of IPLC circuits. The interesting part of these figures that we have found is, as M H has rightly said, prior to the introduction of external facilities competition the capacity was 44 gigabytes per second and new submarine cables would actually bring an additional 480 gigabytes per second. So far, the new overland cables for the mainland will only actually produce 37 gigabytes per second and, for us, we see the difference in those two numbers as being quite interesting. We believe that traffic coming into Hong Kong will have a need to try and get through to the mainland and we can see that the need to actually access the mainland from Hong Kong being of very, very big importance to Hong Kong as an economy and for Hong Kong's strategic position to go forward.

The economic changes that are happening in the industry today are summed up with this chart (reference to visual aid). On the regulatory side, the top right hand corner M H has already spoken about in some detail, but that is, of course leading to a number of opportunities as is the fact that a number of existing players in the market, including the incumbent, are maintaining circuit switched voice networks whilst having to invest in IP networks at the same time. So there's a challenge of the competitors being able to move forward as quickly as perhaps some of the newer entrants to the market.

Coupled with that, not only in Hong Kong but throughout Asia, there's the increasing usage of the internet and also mobile networks and there's recent use of data networks which is all leading to increase in demand for services and traffic.

And, finally, the new technology that is becoming available, and will still be coming available now is producing a dramatic shift in cost dynamics for both networks and services as businesses develop and the cost dynamics that applied perhaps five years ago, or even two years ago, may not necessarily hold true anymore. And our view is that there is a networked economy to be fought. We no longer want to call it the new economy. We call it the networked economy and we believe that that networked economy has to drive convergence. It has to create the atmosphere. It has to give the lead to producing convergence for the user, without that the user would find little value in moving forward into the new era. We believe that will be achieved through the use of broadband and IP, internet protocol.

Just to reinforce that point, legacy technology, this slide is perhaps slightly dramatic but we're just trying to illustrate a point. The networks that have been constructed today have been very well constructed, particularly in Hong Kong, but, by and large, they are networks to support one application or one service, which is not efficient in capital and not efficient in an operational sense and it does not allow convergence. It is our view that broadband IP allows a hubbing effect to the user such that multiple devices can be connected over a single network. That brings a multiplicity of benefits to the user. A single access network is required and a reduction in the comparative intelligence of the application devices that are connected to that network. For the network operator, it avoids having to construct multiple networks and for the service provider it allows a single channel to a particular customer.

So our view is that IP will allow separation of businesses. It allows the network operator to function separately from the service provider. And, very simplistically, the drawing we have shown here, the network business is concentrated on exactly that, producing, building the network and even in building a network which may not be required on an end to end basis. But the end that we see is that networks will increasingly be made up of a patchwork of phone bills, some form of partnerships and some form of leasing arrangements to reduce the total cost to the operator, which allows them to speedily deliver services to their customers and their customers, in this particular model, will be an applications unit for a service provider, an ASP, ISP as we currently know them today, or some new flavour of that in the future.

So these are businesses or units that would focus on the customer in delivering products and applications to the end user. If necessary, products will be tailored to a specific customer, but all the time designed to develop the customer relationship, to bring value to that customer for which the customer is then prepared to pay a reasonable amount of money. Where we see the distinction being drawn is that these businesses need not necessarily be part of the same company. They could be completely separate operating businesses.

So, in summary, if this vision does develop, and we strongly believe it will, what will the customer actually be looking for? He won't simply be looking for a voice network any more. He won't simply be looking for a fax line. We think the customer will be looking for a far greater depth of service, a more comprehensive service than has perhaps hitherto been provided today. As a result, on the network side, M H has already given us detail on international bandwidth, but it won't simply be half circuit anymore. The customer will want end to end. He'll want security that wherever his data or his services are being delivered to in a remote location he has as much certainty and security as possible that the data is being delivered safely, effectively and cost effectively.

IP termination goes without saying. I'll go back to what I said before. Transit though Hong Kong is also an important market sector which is currently not being well served and as Mr Au alluded to for external operators, for example - submarine operators to be able to build their own backhaul will be of greater value to them in providing connectivity between Hong Kong and the mainland. And the development from there, the network operator then has an opportunity to provide hosting services. There's obviously a lot of press talk and speculation around about the IPLC business and perhaps there's over extension in Hong Kong but nevertheless there will still be a demand for content to be held locally, to be cached and restored and updated on a regular basis. The internet is becoming so prevalent these days that none of us can afford to rely on a single server sending content around the world.

Redundancy would also become part of that equation insofar as having content available locally is very important, but also to have redundant routing to deliver that content. And really we see - patchwork is perhaps an unfair description - but we see network operators forming alliances, partnerships to deliver those services to their end customers.

On the consumer side - on the end user - a very much more different set of applications. But, again, very much focused around the consumer or the end user, what he or she is looking for and, again, not necessarily looking for a voice network, but looking for a suite of products and IP as a protocol of technology will allow the suite of products to be delivered to the end user over a broadband connection. And we use the term 1.5 megabytes per second to describe broadband today. It might be slow but, as demand increases for applications, so too will the size of that bandwidth that's required. As I say, we see a virtuous circle between what the service provider is looking to provide and what the network operator is then providing to that service provider, so the service provider can deliver products and applications to the end user.

That's just a very small plug for our own consumer brand, so I shall move right along. Thank you very much ladies and gentlemen for your time.



中電數碼
CLP TeleCom

Breathing Oxygen into International services?



CLP TeleCom: **a new company backed by** **the financial strength of the CLP Group**

Key facts on CLP :

- Celebrating its centenary in Hong Kong this year - 2001
- Owns one of the largest electricity utilities in Asia – CLP Power (Hong Kong)
- 1.9 million customers (up to 5 million users) in Kowloon and the New Territories
- Significant interests in and relationships with electricity utilities in the Chinese mainland
- Strategic interests in Taiwan, Australia, India, Thailand and Malaysia
- Market capitalisation of US\$12 billion; ranked no. 6 in Hong Kong
- Net Profit of HK\$5.7 billion for Year 2000; H1 2001 net profit at HK\$2.8 billion



Hong Kong as a gateway for China

IDD price reduction as a result of services competition from Jan 1999 is well recognised

External facilities competition from Jan 2000 has led to significant investment in new submarine and overland optical fibre cables and substantial reduction (at least 50%) in prices for international private leased circuits so far

Before external facilities competition, total submarine cable capacity available to Hong Kong was 44 Gbps:

New submarine cables landed or about to land will add 480 Gbps capacity

New overland cables to Mainland will comprise 37 Gbps capacity

Source : OFTA

Hong Kong is well positioned to be one of Mainland's gateways to the world

Industry discontinuities are creating exciting opportunities in HK

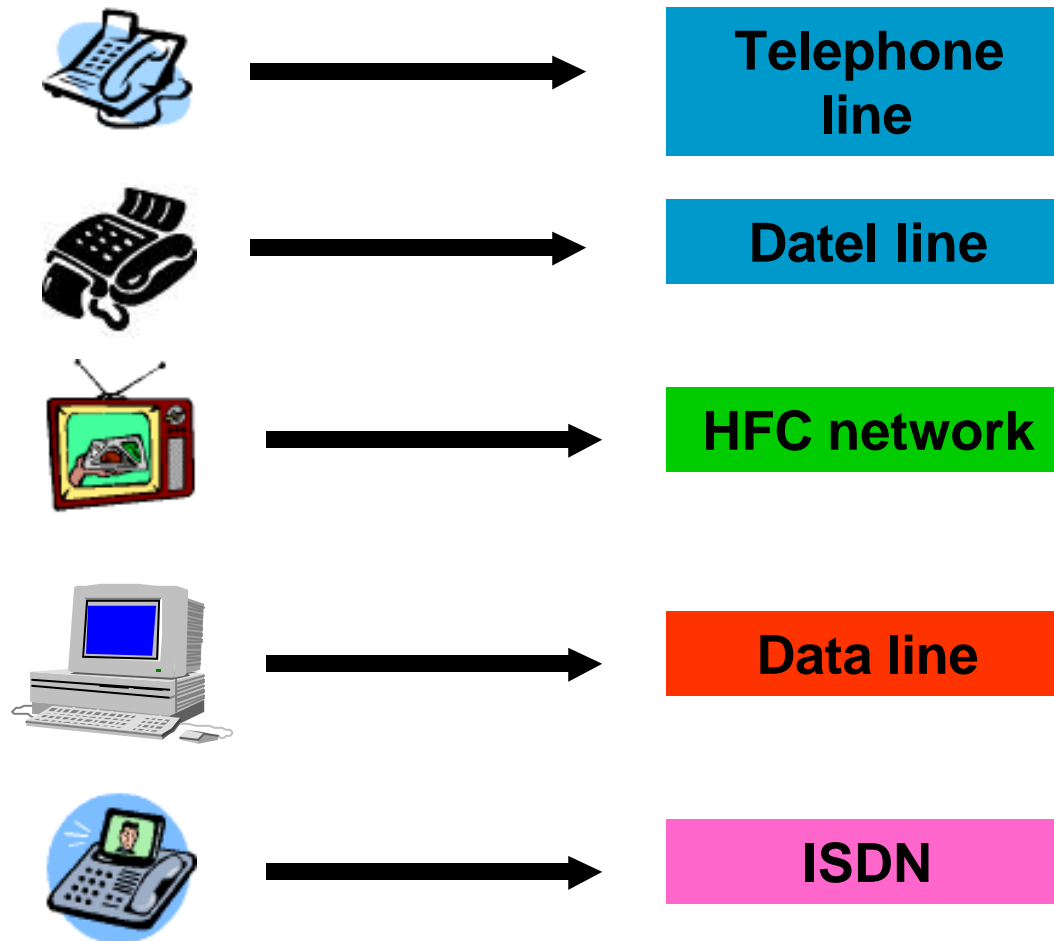
The main story is a convergent networked economy over broadband and Internet Protocol

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Legacy technologies often require one network for each application...

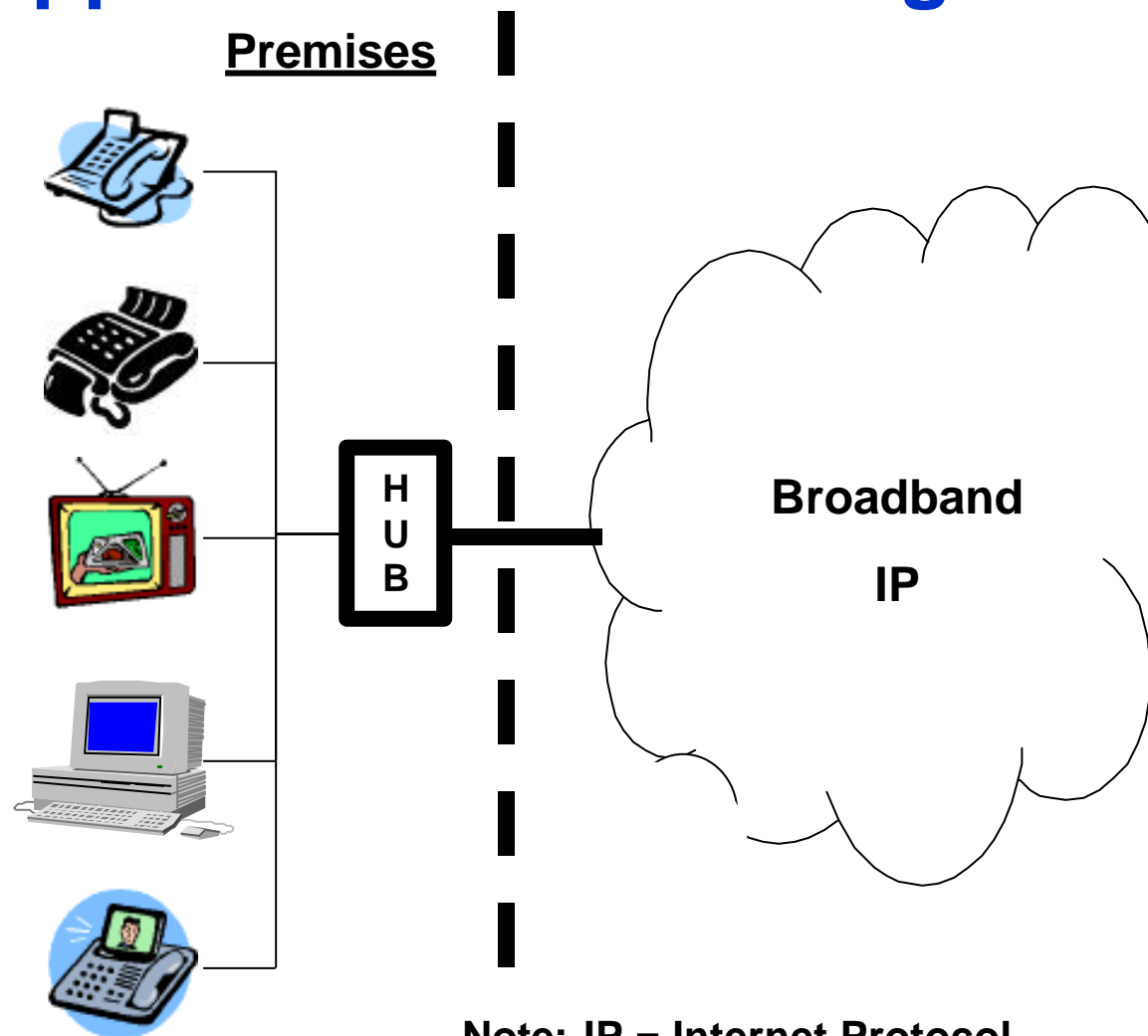


...which is inefficient in capital and operational dimensions...

...and it does not enable convergent application interaction



...but broadband IP delivers all these applications over a single network

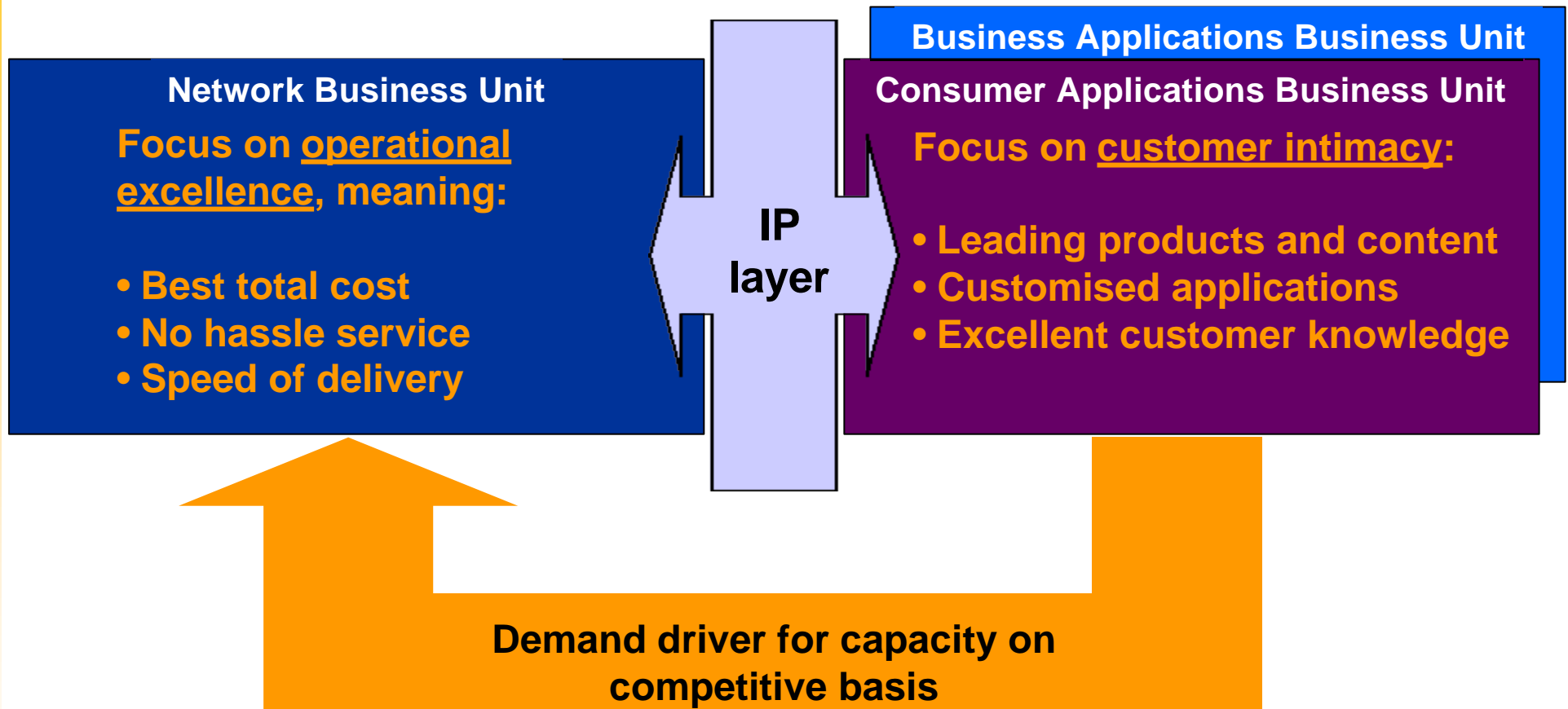


Note: IP = Internet Protocol

...which is efficient in capital and operational dimensions...

...and it does enable convergent application interaction

Thus IP enables separation of business lines on sound propositions,...



...and facilitates the applications businesses to serve customer demand for access to their products...



What will the customer be looking for?

Network Services

- International bandwidth (end-to-end)
- IP termination and transit
- Co-location and hosting services
- Content delivery and caching
- Managed bandwidth services
- Redundancy routing

Consumer Applications

- Dial-up Internet access
- Broadband internet
- Email
- Interactive TV services

Welcome To:

Oxygen



中電數碼
CLP TeleCom

Thank You

John Ure: Thank you very much Terry. Ross will be our next presenter. While Ross is coming up, I think it's kind of interesting that later on we're going to hear very much about international bandwidth coming into Hong Kong and about bandwidth needing to make local loop connections. We've just heard a presentation which very much focuses on that bandwidth at the local loop connection end. Ross, it remains for you to give us the big picture.

Ross O'Brien: Thanks John. You know, it's scary, speaking as an analyst, for two reasons. The analyst never likes to go on after people who actually participate in the industry and no-one likes to talk before a coffee break. But I'd like to try to do that, give a big picture, before we break and have some discussion and place Hong Kong in context of this emerging market for bandwidth and bandwidth-based services.

A little bit of a background: I run an advisory service programme that looks at information technology, telecommunications services in the Asia Pacific region and the following is based on a report that my analyst team is currently preparing on broadband access and bandwidth in supplying Asia Pacific and business service models that are emerging as a result. John asked me to take a look at Hong Kong in the region and one of the things I wanted to start off with in talking about Hong Kong's role is to knock down a couple of not necessarily myths but growing concerns that participants in the bandwidth economy have. Two in particular: that the growth in telecommunications productivity supply will render the service a commodity - read "worthless" - and that the growth in IP and other related technologies in the marketplace will make the provision of this service, if it won't kill distance, it will make at least this location irrelevant. I would like to take a couple of minutes to dispute both those.

First of all, as someone pointed out to me in the course of this research, there aren't many people in the world today that make a very healthy living out of commodities. Commoditisation in the telecoms game has unfortunately been used, as I said, in the same breath as "worthless" when, in fact, one should look at the commodity market in the way in which many players today are trying to install a market sensibility to bandwidth, akin to the way pork bellies or coffee operate, and look at that as a symbol of competition and thus enhanced quality of service, but also in terms of bringing specialised services to the marketplace. The provision of bandwidth goes hand in hand with a variety of professional services, not only on the telecommunications network side, but also in terms of financial management services, management consulting. There's a big parcel of products that add value to the industry, just as the prices of that poor underlying asset of telecommunications businesses are dropping.

At the same time, I caution people against predicting that bandwidth will be a pure commodity in any sense of the word any time soon. As we will discuss in a few minutes, bandwidth levels, particularly in Asia, are still very uneven, as are end user requirements throughout Asia and throughout the world. There are very few markets today that have fully, or even remotely full, liquid markets for bandwidth. So the trading of bandwidth as a uniform asset is some ways away.

And, on the second point that telecommunications network makes location irrelevant, I could argue, as M H and Terry pointed out, that there are considerable assets to Hong Kong as a place to do telecommunications business and you can find that in quite a lot of other markets in the world too. Business still needs to be conducted somewhere, and so does telecommunications business and that makes bandwidth provision in a marketplace still a very location-specific business. But access to cheap bandwidth is not the only thing that a world class telecommunications network market needs. It is one in a suite of operational costs and in many ways Hong Kong stacks up very favourably. We will revisit M H's value

proposition. Hong Kong is a regulatory hub and there are other things that Hong Kong perhaps does not do as well. While bandwidth may be a cheapening operational cost, it's about the only thing that's getting cheaper in town and the access to the professional, the actual labour input, is increasingly value-added. Service spaces are also scarce and at a premium when compared to other hubs in Asia.

To define what that's going to do in Hong Kong's bandwidth market - it's going to make for a sliding scale as we see market participants move up and down these value chains to find their niche. So I think what we're going to be looking at in Hong Kong is a lot of running for niche ground in the next couple of years. We're going to see a lot of specialisation, even in wholesalers of bandwidth service provision, and I think that that alone will make Hong Kong a very interesting, a very well provisioned telecommunications service market in this economy.

Just to underscore MH's earlier comments about Hong Kong's position in the region, I would actually say that he was being fairly modest. While it's important to continually keep your eye on your competitors, I would say that there are very few competitors to Hong Kong as a low intervention, highly transparent, regulatory hub. While Singapore obviously is catching up, and M H alluded to the big bang that brought liberalisation levels up to Hong Kong's level *on paper*, I think you'll find that in practice Singapore still wields a bit of a heavy touch with regards to facilitating liberalisation in the marketplace. In fact, we feel that no market, other than Australia, shares this enviable combination of transparency and light-handedness in its overseeing of telecommunications services and that, in our opinion, makes it a very good place to set up a hubbing business and to set up the types of professional services that we see as coming out of Hong Kong as a crucial transit point.

I'd also like to touch upon Terry's business in a regional perspective and look at the way in which broadband access is being provisioned in Hong Kong as another catalyst for a new class of network services that are going to be enabled by cheaper bandwidth. While not suggesting that the new gigabytes of capacity that are being laid up on Hong Kong shores have created the IPLC explosion that we're seeing in Hong Kong, the underlying structure of the regulatory environment has given rise to a very competitive market atmosphere. Nowhere else in Asia, apart from Korea, are there as many broadband subscribers as a percentage of paying internet subscribers. Japan is large and looming in the centre of this diagram but as we very generously lumped ISDN lines in with broadband access and the provision of ISDN is a very different market dynamic in Japan. The chief carrier - NTT - is essentially subsidising provision of ISDNs, trying to prime the market. We're seeing a lot of ASDL conversions from ISDN now, but what's given Japan any prominence on this graph has been the fact that it has been sitting on a billion plus dollars worth of ISDN equipment that has been slowly rotting and it's found a way to get rid of it. What you're left with - Korea which, as everyone knows, is a cut-throat broadband access market and Hong Kong is obviously going that way.

So Hong Kong's created and distinguished itself as a domestic market, as a hungry domestic market. I'm not going to suggest that this is enough to foster Hong Kong as a broadband hub because, although it's a very well served, very internet-savvy marketplace, it's also a very small marketplace and, as both of my colleagues have suggested, that it's Hong Kong's role as a transit point that is often overlooked but must be re-asserted as the primary goal, or a primary goal, of service businesses in the region. And that's because we are staring at a whole lot of fibre coming our way.

This is very cartoonish and back of the envelope estimates, but based on our initial conversations with participants in the industry we're looking at total available capacity, in whatever ultimate way you can define it, as cruising towards the 16 terabyte level in a couple of years' time. Now granted most of that is going to be dark and not utilised in the

foreseeable future, but what that does is create an inventory management issue for market participants. It would obviously give rise to the presence of middle men in the market - the brokers, the traders, the exchange players - that have raised the collective consciousness of the notion of bandwidth as a commodity. But there too there is the problem, as it was pointed out to me by wholesaling market participants in the course of this research.

Commodity markets are categorised by a uniform cost infrastructure and a uniform way of describing the commodity. They also exist in a market that can go up as well as down and bandwidth is one of those odd markets that will usually tend to go down and, barring acts of God or cable cuts, not really go up again. Moreover, you've got participants in this market space that are very rigorous in their planning. Very rarely do you find a major wholesaler or major international traffic carrier on the retail level not thinking through their bandwidth requirements on a very vigorous and very rigorous basis. Therefore, middle men market participants have a tough space to carve out for them if they want to make bandwidth a traded commodity but, if they are to do it, Hong Kong would be an ideal place to start. It is, as M H pointed out, a transit point for nearly all the trans-Pacific routes that are coming through. So, most of this massive wash of capacity is going to come through Hong Kong at some point, as are the professional service layers over that going to set up shop to cater to a fairly robust crowd of multi-national clients.

And Hong Kong has another added value in the location department in that it does exist in North Asia and not South East Asia. That is significant because, in actual fact, Asia as a marketplace is a long way from having equitable bandwidth supply levels north to south. There is a large north/south divide between the very active markets in Japan, Korea, increasingly China - where people are turning their attention towards, and Hong Kong, and the marketplace of South East Asia, with the exception of Singapore. And if you just did a quick price comparison - now bandwidth prices tumble continuously, and I haven't looked at contract price terms in the last couple of days - but if you were to price out a DS3 between Tokyo and Los Angeles, a year ago you'd probably find it was two or three times what the similar price of a circuitry in New York and London would be. Now the discrepancy is not that significant. It can be about twice as much but they're coming closer all the time, as are rates between Tokyo and Hong Kong. For the well-served fairly bandwidth-intensive markets, the highway routes if you like, bandwidth has tumbled, prices have dropped on average between 50% and 80% year on year. They are probably falling towards some sort of natural equilibrium level but they won't evaporate entirely.

If we go beyond the highway routes, and you look specifically at trans-Pacific routes and Singapore, you hit a very different picture. Partially because the level of demand in the market that surrounds Singapore, i.e. South East Asia, is nowhere near that level of demand that you find in Tokyo, Seoul, Hong Kong or even Beijing. And partially because, as I mentioned, Singapore isn't yet as competitive as Hong Kong in terms of the number of international players that have committed themselves to the market, in terms of the amount of capacity committed to that market. So, the hubs, and the fact that there's a lot of competition for regional business between the hubs, means that one of the most expensive routes of all are between these two Telecom service Meccas, Singapore and Hong Kong. Perhaps I should have put Hong Kong and Beijing up there and put this whole graph to shame. But even there, even in China, in particular this week, with WTO accession, we're going to see prices and quality of service in China move in a more fairly competitive, more equitable pricing level way than we'll see in South East Asia any time soon. So on the one hand, China represents a large part of Hong Kong's future as a telecommunications hub. For another, as is pointed out in this briefing paper you have in front of you prepared by John's team, that China is also another element of competitive threat to Hong Kong.

But, the concluding point, if I could leave you with this, is that bandwidth is not anywhere near a commodity yet. There are not only uneven supply levels, there are many

discrepancies and disparities in the level of professional service, that surrounds the provision of international bandwidth and, in more ways than not, Hong Kong stands out as a place to do telecommunications business in the region.

Thanks for your time.

Hub Club, v2.0

Hong Kong's role in Asia's bandwidth economy

TIF

September 2001

Ross O'Brien

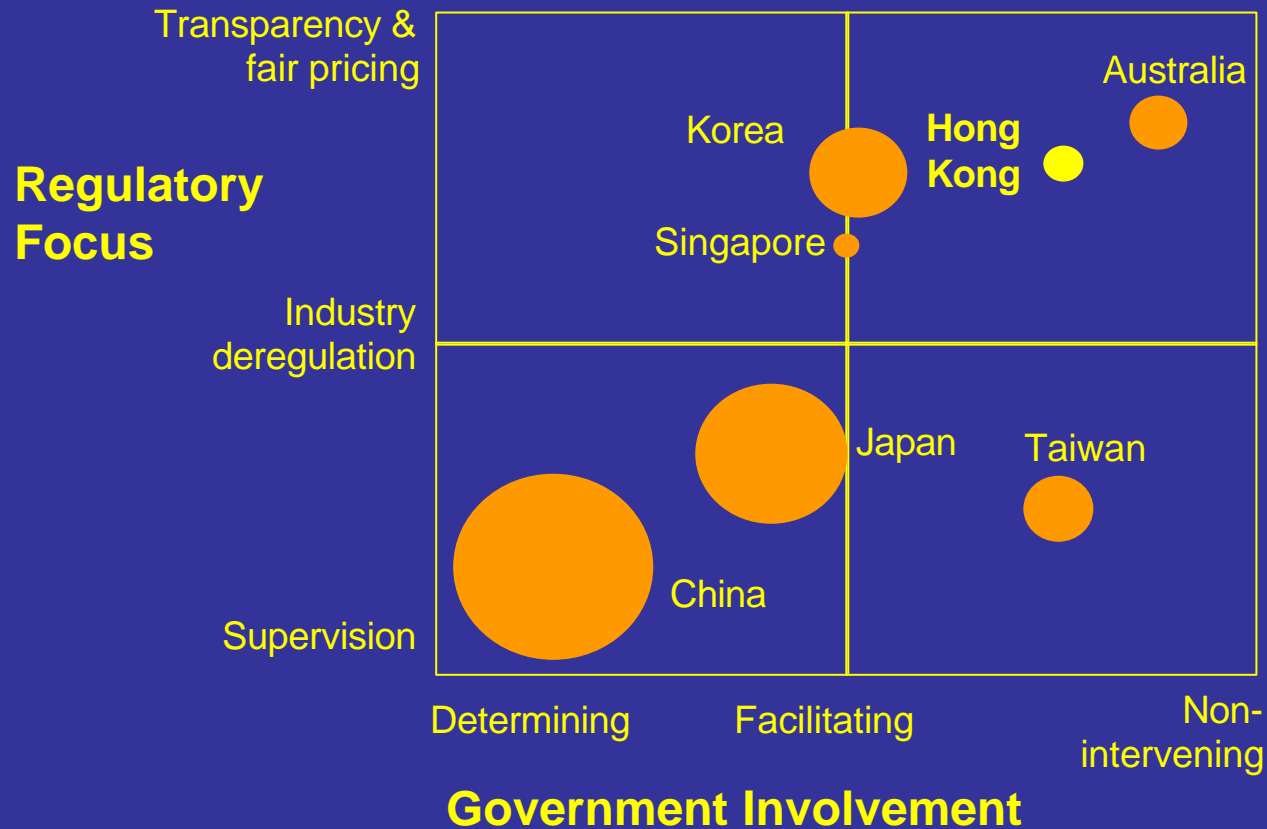
Research Director, Advisory Services

Hong Kong as Fiber-opolis?

- Commoditization isn't a dirty word
 - Bandwidth prices are falling, but will not collapse
 - Market models for buying and selling capacity will take years to evolve
- Location still does matter...
 - but access to cheap & plentiful bandwidth isn't enough
- Market dynamics will force players up and down the value chain
 - More specialization (even in the wholesale market), less "soup-to-nuts" service portfolios

Management issues

Asian communications policy matrix, 2001



Hong Kong has the policy foundation for hubbing

● Total fixed & mobile subscribers
(China: 215 million)

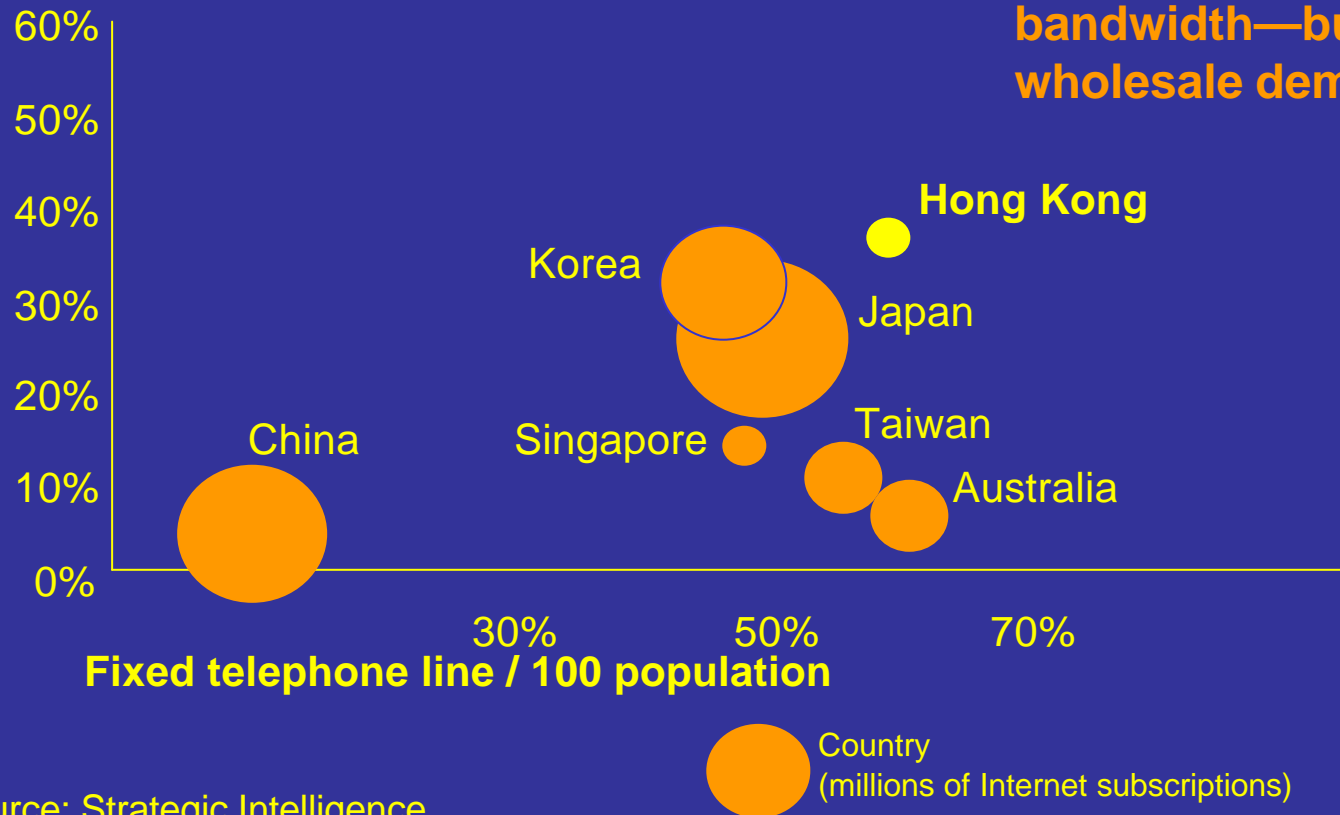
Source: Strategic Intelligence

Hong Kong's need for speed

Internet connectivity & access speed, 2001

Broadband accounts / 100 Internet subscribers

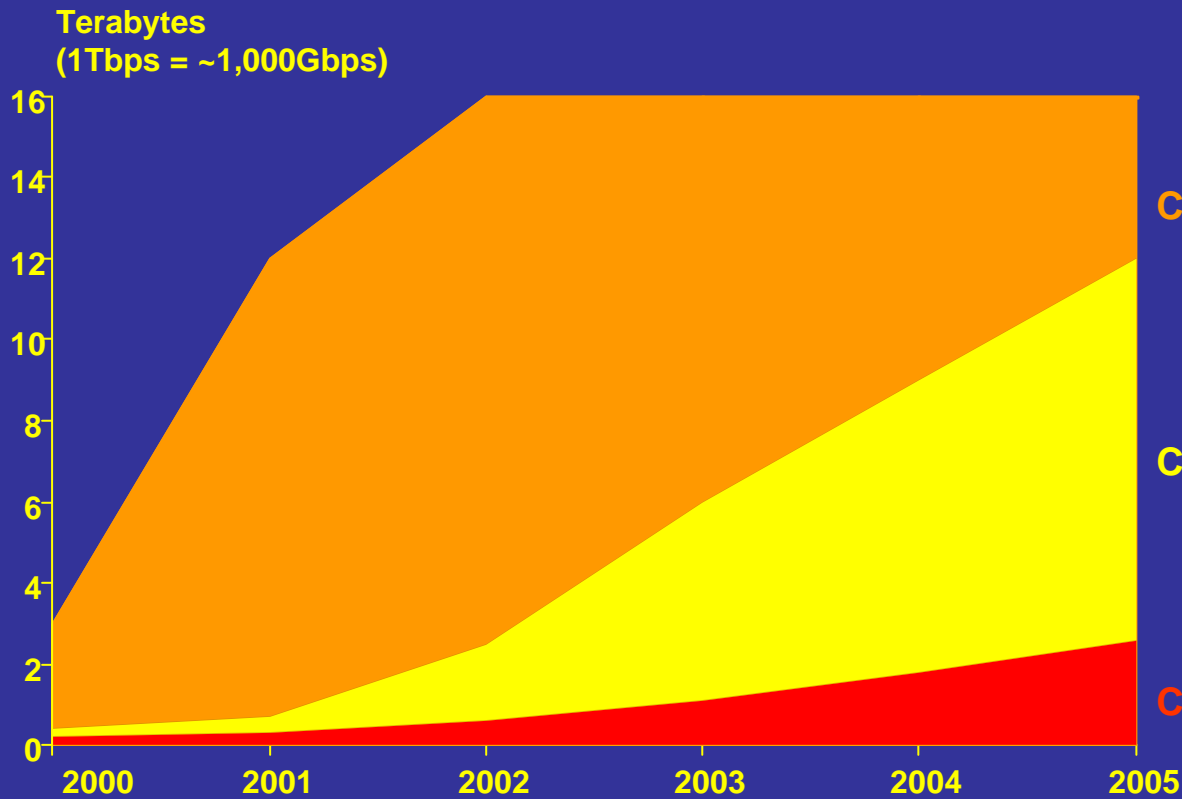
Hong Kong's access market is already indirectly benefiting from cheaper bandwidth—but will that fuel wholesale demand?



Source: Strategic Intelligence

From scarcity to scary supply

Aggregate Transpacific capacity, 2000-2005



Much of the Terabytes crossing the Pacific will transit through Hong Kong—but how much will be used?

Capacity: Total (incl. 'dark')

Capacity: Lit

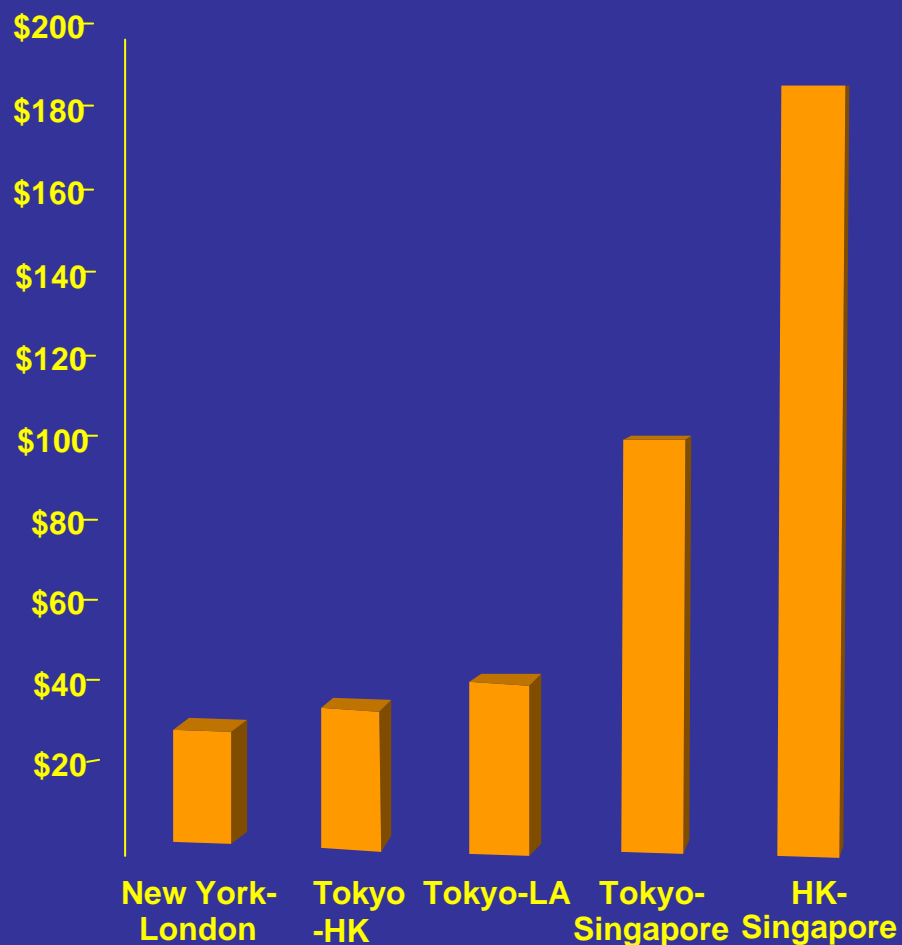
Capacity In service

Source: Industry consensus estimates, Strategic Intelligence



Long way towards commoditization

DS-3 (~2.5Gbps), 12 month term beginning Oct 2001, US\$000's



Uneven bandwidth landscape in Asia will mean liquidity—and equitable supply levels region-wide—will be some time in coming

John Ure: Stay where you are. M H and Terry, would you like to join me on the platform, because now is your chance to ask some questions and to make any comments that you may have.

So, thank you for three very informative talks. It certainly seems from the contributions - particularly Ross' - that Hong Kong emerges in a slightly favourable light, still, and I wonder whether if we met again in five years' time that would still be the case in terms of other communities catching up. So let me start with one question. Mainly to Ross and M H, but maybe Terry has a view on it as well, and then I'll open it up to everybody.

On that point, Ross, you seem to be suggesting that the central competitors to Hong Kong - Japan, possibly Korea, Singapore - although they may be gaining lots in bandwidth, it's much more difficult to change what we might call the regulatory culture, or policy culture, so that bandwidth is just not sufficient. Do you see that changing, or do you think that it's going to be very difficult for those centres to become like Hong Kong or like Australia in terms of liberalisation of the regime?

Ross O'Brien: Well, there are only really four places -- anyone who is a seller of bandwidth at the wholesale level really only has four places to set up shop in all of Asia - Australia, Singapore, Hong Kong and Japan. Nobody else has a regulatory environment that even approaches those four destinations in terms of landing rights and reselling ability. And in Australia, as mentioned, while the regulatory environment is very transparent, it is also a market that is relatively small and very far away. It has made some progress in the status of the hub, but it's still far away from the heart of Asia. In Japan, anyone who knows the Japanese market knows how slow the regulatory gears grind and they know that the weight that NTT continues to carry in the marketplace. Singapore is mentioned. It's also a small market with a pocket of low demand for these types of services. The basket of goods, with regulatory policy as the seed contributor - I don't see these other three places moving to catch up relatively quickly, let alone anywhere else in the region which does not even approximate Hong Kong's clarity of regulatory framework.

John Ure: And M H, do you as a regulator get together with any frequency with your colleagues from those other places like Australia, Japan, Singapore and so on - and what's your impression about how far they may take their lead from places like Australia and Hong Kong?

M H AU: We do have forum in which our regulators from one region get together and exchange views and information on various issues. For example the telecommunications working group of APEC is a forum of regulators round the Pacific Rim region which regularly includes administrations from Japan, from Chinese Taipei, from the United States, from every country around the Pacific Ocean. I think, as the regulator in Hong Kong, it's very difficult for me to comment on the policies and directions from other countries because I think every country will have their own ideas or their own ideology, their own problems and the administration there must be embarking on some policies that are seen to be most beneficial to their own countries. So you might find that there may be certain administrations which at least, in the initial years, cannot approach the extent of liberalisation that is being practised in Hong Kong and Australia, mainly because of the different status of developments of the community. Of course, there seems to be a general trend towards increasing liberalisation, and obviously the WTO will explore rounds that contribute liberalisation. I think there must be some differential between the different policies and extent of business in different administrations around this region.

John Ure: Okay, we'll continue with the offshore theme, you must get a lot of the enquiries from other regulators about how things are done in Hong Kong.

M.H. Au: Oh yes. We provide information. We provide finance and some training. It's really up to the different governments and economies to develop their own models. They can compare Hong Kong with Singapore, and Hong Kong with Japan and then Hong Kong with the UK and the United States, and then decide which approach seems to be in the best approach for their countries.

Ross O'Brien: The only other observation I would make is that Hong Kong, because it's essentially a city economy in comparison with some of the other economies in Asia, does have a strength, insofar as, I think, of how to react a lot more quickly. M.H. referred to a sort of vested interest from other countries. Hong Kong does have somewhat less of that baggage perhaps than other countries, and therefore can move that much faster.

Apologies to readers at this point, the transcription of the Q&A session was faulty. The following is a summary of the points raised and answers given.

1. OFTA decided to delay the transition to full liberalisation in 1999 with a moratorium on new FTNS until January 2003. This was to give time for local competition to become effective.
2. What will drive demand for bandwidth?

Ross O'Brien: Well, whether it's gaming, video conferencing or some messaging-based application -- I'm not sure -- I'm somewhat application agnostic, but what I do believe is that the thing that you mention that will drive bandwidth use, are all applications which take advantage of the inherent value of the network. If you like, it becomes hard, as broadcasting and teleconferencing moves closer together, to rationalise this central premise of the telecommunications network. The value of it grows with the number of users around it and the ultimate killer application is voice traffic. The user defines exchanges with another user. This is not -- I'm not necessarily waving a P&T flag but, if you like, it is applications which take advantage of a network that promulgate communication between users on the network that will be ones that drive bandwidth growth the most. And content that enters into that environment is going to have to take note and evolve itself into the chatting framework that telecommunications networks thrive upon.

Participant: As a regulator, what do you take out of the failures, if you like, of the many start-ups in the US market in the local loop? After five years of deregulation there we have basically the old Baby Bells still the only ones that would seem left standing. What sort of lessons are there if any for you? We have a lot of access networks in Hong Kong including a number of wire fixed access networks that have been with us some time, and HKT still overwhelmingly owns the local loop. What's your take on the failure of the US and is it a priority to get real facilities-based competition in the local loop in Hong Kong?

M H Au: Yes, we have taken a number of initiatives to increase the end customers' choice in getting the front-end access over the last few hundred metres or the last mile, so there are a number of alternatives. Unbundling of local loops in Hong Kong... is just one of the alternatives. The other alternatives include cable ...But I must say that, in line with other regulators with similar liberalisation policies, unbundling of local loops is still one of the major initiatives, at least in the initial years. Mainly because all the other alternatives say for example wireless access such as L MDS, the coverage in the middle years cannot be compared to a well-established copper loop network which has been built over the years. We're not saying we do not wish to encourage facility-based competition; we do encourage facility-based competition, but we believe that we provide encouragement by providing the correct pricing signals for interconnection...

John Ure: Can I just follow that up? Would OFTA have a problem if there was effective services competition but no facilities competition?

M.H. Au: We do encourage facilities competition. With just one network there would still be competition among the services but that would not be sufficient because we believe that there are some elements which can compete amongst the networks. It's not just about network coverage, its also about network quality, network reliability, responsiveness to users' requirements so we do believe in facilities competition. We were asked to encourage facility competition and in due course there will be facilities competition in the customer access network.

John Ure: The reason I ask that is in the recent consultation paper on interconnection, one line of argument could be, that if the policy is designed to achieve facilities competition, then you could go directly to a fully distributed cost mechanism, because that way it would really push the alternative operators into building their facilities. Which is, I note, the OFTA view.

3. A question was asked about whether any encouragement was to be given to the use of voice over IP (VoIP) in Hong Kong. OFTA's has no policy of encouragement or discouragement of VoIP, its up to the market.

Participant: A question for you Ross. Your chart from scarcity to secure supply indicates that the actual capacity in use is maybe overall 90% lower than the actual full capacity that's been laid down. The question I have is in relation to the sustainability of the companies that have invested billions of dollars laying this huge network on the road, prices will surely get lower in the short term. Do these companies have the resources to survive the next five years through low prices? If not, who would like to buy this capacity at some point in the future and who will end up owning this network?

Ross O'Brien: Quite a few people in the audience will have a more vested interest in answering the question than I do. Do they have -- yes. The short answer is, yes. While there is, in some reckoning, over-capacity, there are various models for what to do with that. Is it in your best interest to drive the price of your core product into the ground just to clear your shelves? It doesn't work that way in any other product or service business. Why should it in bandwidth?... as pointed out there's not a uniform supply landscape anywhere in Asia, much less the world. I mean, if you're worried that much about commoditisation look at where bandwidth is actively in traded play, there are only two routes in the world: New York to London and New York to Los Angeles. And that still often boils down to contracts on specific cables, which are known to the participants for their quality and reliability.

We're a long way from the purely abstract notion of bandwidth and the level of quality and service, and the professional services that wrap around that - whether it's managed facilities, whether it's assistance in things that you wouldn't think of when you think of a standard player, such as recruitment or personnel outsourcing. There's a vast range of professional services that you can tie in with bandwidth, and I think that the realisation that there is a glut in some sense in the market place, is causing a lot of carriers to think creatively about how we deliver service. So those that do come up with a well defensible niche that has bandwidth as a component of their service portfolio, I think will survive.

Terry O'Neill: Yes, I think there are two elements to it, is an awful lot of fibre fighting for a market. But then there's the other side of the coin which is the cost of operating a network and try and forcing a bit of data from Los Angeles, for example, to Hong Kong, or Los Angeles to London. The cost of that transport is infinitesimal. If one compares that to a model of moving, say, a package over the same distance, then the two really don't compare because, by it's very nature, the telecom system operating fibre optic network can do it at a fraction of the cost. So I think, yes, there is a concern perhaps that there is overcapacity, but then the plus side to that is that if the operators can actually put enough traffic over their networks and then by using DWDM, using diverse routing and then offering products and

services above that, they're then starting to move away from this commoditisation fear. It will always be there, but if operators can actually seek to differentiate themselves, I think there is a win/win for a lot of people.

John Ure: Okay, final word to M H. Will he be out of a job in five years time? [laughter]

M.H. Au: Five years time I'll probably retire [laughter].

John Ure: Oh, you must never retire, M.H. - you must never retire. I'd like to thank our three panellists for this first session. Really useful. There was lots of material there. Our second panel after the coffee break in half an hour will be essentially carriers and Simon Chan from the Telecom Users Group and David Werner here will be firing questions at them and getting them worked up and then opening the floor to you. So, with that note, can I thank again M H, Ross and Terry for excellent presentations. Thank you.
[applause]

Panel Two

Brain's Trust of Big Carriers in Hong Kong Plus a Representative of the Hong Kong Telecommunications Users Group

Speakers

Question Master: David Warner, Telecoms & IT Consultant and HKTUG Exco

Panel:

Tom Boasberg, Level 3

Dermot Keilthy, Reach

Kelvin Law Teleglobe

Ted Ringrose, Worldcom

Simon Chan, HKTUG

John Ure: This session is basically the position of large pipe carriers bringing bandwidth into Hong Kong and the panel is Tom Boasberg from Level 3 - here's Tom. And Dermot Keilthy from Reach - here's Dermot. Andrew Kwok in fact is Kelvin Law from Teleglobe, Ted Ringrose from Worldcom and Simon Chan, the chairman of the Hong Kong Telecom Users Group. Simon also works for Compaq, before that Digital, and has been for many years a major advocate on the users side, as has David Werner. David is also on the executive of the HKTUG and was formerly with Hongkong Land, a major user of telecom user. And David has over the years been a vociferous critic, I would say, of some of the suppliers, and is now running his own consultancy group, so we couldn't have a better question master to lead off this session than David. So I'm going to hand over the mic to David, unless he destroys the one he's playing with right now, and he will comment, get everybody's temperature rising high, and then will invite you to add your thoughts as well. David? The floor is yours.

David Werner: Thank you all for coming because according to a recent Nokia commercial I've seen, none of us need to be here. I would like to quickly start by having each gentlemen explain their core business very quickly. I mean, their core business and their job within that core business. Can you start Kelvin please?

Kelvin Law: I am the Managing Director for Hong Kong/Macau and of business development for Teleglobe. Wholesale is our major business at the moment.

Ted Ringrose: I am Ted Ringrose from Worldcom and I look after the legal and regulatory matters for Worldcom in Asia and Worldcom is a full service operator concentrating on what we call the 'high end of the market' for carriers and for large corporate customers mainly.

Dermot Keilthy: I am Dermot Keilthy. I am director of regulatory controls for Reach and Reach is a predominantly wholesale carrier for other carriers and large corporate businesses.

Tom Boasberg: Tom Boasberg from Level 3. Level 3 is an Internet backbone company whose core service is communications-intensive. Customers are primarily ISPs, carriers, internet players, content providers, application service providers, who may potentially sell broadband international backbone services between Asia, the US and Europe and internally in those countries.

Simon Chan: I am Simon Chan. I am the Chairman of the Hong Kong Telecom Users' Group. I think you know the Telecom Users' Group - it was formed more than ten years ago. We had a very clear mission at that time which was to liberalise the market in Hong Kong.

This has been largely achieved, and now we have to find new roles. We see ourselves as working through the various issues and monitoring the limitations on different markets. We are now a smaller group than before because throughout the years there has been a lot of consolidation and reduction of the workforce. But we are welcoming managers who use telecoms and not just those who are responsible for managing them in companies. I am one of them because I used to run the Asia Pacific telecom network for Digital then I changed my role in Compaq. I just asked my fellow vice president whether the maximum bandwidth cost has changed and it has dropped to about one tenth of the costs we had five years ago. So in five years we have chopped about 10% off the cost.

Any country operating or making use of these international values is going to save a lot of money. That means the spending budget of the technical manager is much smaller than before... Okay, but that's the architecture of our business. So I want to try to represent the users' view are in this forum.

David Werner: That's good because the user is clearly outnumbered. We have four cable providers and one user. Is there anybody here from OFTA. Yes, oh good, because I get the sneaking suspicion they're going to all gang up on you possibly. We will have to find out so that perhaps you can say something back. Kelvin, our first question is that Ted referred to his company as a high end carrier's carrier and you simply said a carrier's carrier. Could you explain where you are in the quality level and how that gets defined? What's the difference between low end, middle end and high end carrier's carriers please?

Kelvin Law: I think as a provider and supplier you know my answer, okay? I think in the States some of them are our exiting customers. So I think to a certain extent whether it is a carrier to carrier, or a carrier to an end user, the quality and the price are now the major factors. I think in order to maintain your customer base I think your quality and also your price will be the two factors.

David Werner: What are the defining essences of quality?

Kelvin Law: I think there is a norm in the market, on the data services or on the IP side. I think it is about attitude.

David Werner: Okay. Ted, all carriers have to have absolutely spot on reliability. What distinguishes - most people will have to say they are 99.99999%, 99.999999%, 100% reliable. What are the distinguishing factors? What carrier can say, "Well I am only 99% reliable so I can be a little cheaper". I don't think anybody can admit that so how do you think carrier's carriers distinguish themselves?

Ted Ringrose: I am more in regulation, so I don't really know that much about the network in terms of the measure of its quality.

David Werner: Okay. I don't think any of us could answer for the whole company. [*Another spokesperson for Worldcom in the audience referred to service level agreements (SLAs) which Worldcom entered into with customers – JU*] Thank you. Dermot, what's behind this JV between PCCW and Telstra?

Dermot Keilthy: Well I think there seems to be an opportunity to combined the facilities from the two existing networks and by running them as one we ... gain a greater efficiency than running two discrete networks. And then there was a commonality in terms of what both companies wanted to do in terms of expansion. So I think that those two things were probably the driving factors in the creation of Reach.

David Werner: Is there a bandwidth surplus?

Dermot Keilthy: There is certainly a lot of bandwidth about but I think it was referred to in the earlier panel discussion that nobody is necessarily just going to lift the floodgates and all this bandwidth suddenly comes onto the market. It would be worked in a managed manner.

David Werner: Yeah. It looked like Telstra took a unilateral move on that write *down* [of assets –JU]. What's your thought on how the long term money is going to be made out of all this bandwidth?

Dermot Keilthy: I'm afraid I cannot comment on behalf of Telstra and what their plans are.

David Werner: Well maybe someone else wants to comment. That would be interesting.

Ted Ringrose: About Telstra?

David Werner: No, no I am just asking about why that seems to be a contentious move. But Tom, somebody did ask at the previous session about the survivability of companies that did sink all these costs. How will the companies dig themselves out of this?

Tom Boasberg: It is essentially about the amount of bandwidth out there and not being utilised. People talk a little bit about having 8, 10 terabytes of capacity out there that is not utilised at this point... People have to realise that when we install the network, whether it is terrestrial or submarine cable - you put fibre in the ground, you put fibre underwater, and the marginal cost of laying additional fibre pairs on that cable or underground is close to zero. So you might as well instead of laying 2, 4, 6 or 8 double pairs you might as well lay 48 or 96. As against the costs here of construction and digging roads and then actually lighting the network with electronics the marginal cost is close to zero. For example the marginal cost of building and the cables between Hong Kong and Japan that have a total capacity of 2 terabytes is less than 5%. So it's really [pointless ?] sometimes to talk a lot about unused capacity. The question really is how much capacity is lit. That is where the capital comes in. They have to put the electronics on to light the network. ... [Tom goes on to explain that lighting up additional capacity in a very short time to guarantee service quality levels is only possible for the small number of operators who have build state-of-the-art modern transoceanic networks, and the real value of the investment is in having that capacity available when it is required – JU]

David Werner: Some analysts say that companies are unable to light the fibre right now. They just don't have the financial wherewithal to do it.

Tom Boasberg: I think that's true. I think that as you've seen, 1998, 1999, 2000 an extraordinary ability to go into capital markets, raise your hand and get capital. Level 3's been a beneficiary of that. As a new company we raised U\$14 billion in (inaudible) of debt and equity. I think what we are seeing now among the newer generation of carriers is a real separation of those who have cash and those who don't. Those who do not have cash right now simply do not have the ability to go out and invest in a network and put the electronics on are having great difficulty. As we've seen already unfortunately, companies that are probably necessary for the industry, a number of those have gone bankrupt already. I think if you look at the folks that are out there now, look at how much cash people will have and the companies that really have cash right now I think will have the ability to light and will have the ability to catch their opportunities.

David Werner: Kelvin, what is the biggest impediment to profitability? Is it the capital markets or is it something else?

Kelvin Law: [Kelvin explains that now traditional carriers like Teleglobe rely heavily upon their operating profit. That from the mid-1990s Teleglobe shifted from being a traditional bilateral carrier to becoming a world business carrier offering both core services and IP network. Most recently bandwidth has become more of a commodity, prices falling rapidly, so Teleglobe is migrating its business model towards emerging market sectors – JU].

David Werner: It seems like lately everybody got something wrong when they laid all the fibre and didn't light it and thought they could go back later and get more money to light it all. Why didn't they light it as they went? Anybody can - why is there so much unlit fibre?

Ted Ringrose: Because as you pointed out, it costs a lot of money to light it.

Tom Boasberg: I think it isn't so much unlit fibre as the marginal cost of having unlit fibre is close to zero... The marginal cost of putting in 12 fibres versus 96 fibres comes out to less than 1% or 2% of the total construction. It is real easy to put the fibre in the ground now and when the demand comes we will then be able to ... use that revenue to buy the electronics to light it. There is no reason today to go out and light fibre, the demand is simply not there. ..

David Werner: I am pretty sure - I don't know if anybody wants to say so but I think it is pretty obvious if anybody looks backwards, everybody has missed all their targets on the business models. What went wrong in the estimation of how much bandwidth we were all supposed to want? That's what we heard about three to four years ago. We had insatiable appetites for bandwidth and it seems like it was quite easily disabled. What was wrong with the models of four to five years ago?

Ted Ringrose: What are you actually looking at? Worldcom hasn't actually missed any of its targets in Asia - we're ahead of plan in Asia for some time. But I guess for a lot of people there was the double whammy of a lot of competitors coming in and suddenly there being more capacity around and customers realised that they could make a change and you didn't have to stick with the same person any more. So competition affected the price and a lot of people started to suffer when they had to pay back their significant debt loads and therefore were very interested in just going for revenue rather than for profit. A lot of people in Wall Street and the NASDAQ markets want revenue growth. They weren't interested in profit, versus people who were just willing to go out and sell the capacity for not much at all. The other element was the dotcom crash which made a lot of people lose confidence in that business and therefore a lot of those customers have disappeared for some of the carriers.

David Werner: What has to happen domestically to make people want all this international bandwidth? What changes that? You guys don't really have control right to our homes and our businesses. What has to happen to scale that? It doesn't do any good if we all have 56K modems and we all have even ADF files if you guys are laying more and more fibre. What has to change domestically in all these markets?

Tom Boasberg: I think it is predominantly having the right services on the end of it. Content. Something that people want to buy.

David Werner: What stops that from happening right now do you think?

Tom Boasberg: I think what we are seeing is in terms of the dotcoms is some of them have downsized and you are just basically not seeing the same rate of growth that quite a lot of business plans were based on a few years ago. There is still a demand though. There are still new products on the market.

David Werner: Is anybody out here in the multi media video business? Nobody here? Because I wanted to get a feel about what the lag is between when all these IP and TV and video convergence is going to happen, because that should suck up a lot of bandwidth, shouldn't it?

Participant: I think there are a couple of things... that are important to users in Hong Kong to really enjoy the ability to use that bandwidth. I think we saw earlier about local bandwidth in tens of gigabytes of capacity coming into Hong Kong with a lot of users still on, as you said 64 kilobytes or even sometimes on a one megabyte T1 line or ADSL line. The performance isn't strictly international services -- this is not ideal. I think the two things are, one is getting the ability for those entities that provide services directly to end users through ISPs and other providers like to end users to have genuine competition. Where is the multiple access for facilities to get across to end users and secondly, those that don't wish to build their own local loops, they should be able to unbundle and get access to the incumbent's former monopoly loops at fair prices in Hong Kong. And then people will probably start using the bandwidth.

Secondly, I think we find as international carriers in Hong Kong, that Hong Kong right now is the only market in the developed world that has a restriction on the ability to build local call access. There is no other market in the developed world right now that restricts companies from building their own local call networks. Not surprisingly, we have a situation where the local and international costs in Hong Kong are extremely high. Far higher than those of other economies that allow competition. You have a situation where Teleglobe, or Worldcom, or Reach to a lesser extent, or Level 3, want to provide services directly to ISPs in Hong Kong, they pay an extraordinarily high toll to Hong Kong Telecom to use the local network. And so [competition and access to wholesale and retail bandwidth for ISPs to provide cheaper high-speed local access is necessary – JU].

David Werner: When you say it is worse, you mean compared to Europe or North America?

Participant: To the United States, Canada –

David Werner: Wherever it is it's still I think better - is that a fair assessment?

Kelvin Law: [Kelvin challenged the view that international costs were necessarily higher than in the USA and Europe, but argued that the key was to encourage more end users to adopt Internet-related and IP-based applications – JU] So if Hong Kong can develop more content I think that will be very good. ... there's a lot of good content in United States or Japan and now in China, but I think we have to encourage local content and I think we will have to have a whole end-to-end chain.

1. A discussion took place with participants about the delay in the deployment of multimedia applications, with the view that devices for mass home use were still about 6-9 months away. The adverse turn in capital markets had slowed the process.
2. There was a short discussion with a venture capitalist participant about funding trading markets in bandwidth, but clearly the volume issue was the uncertainty.

David Werner: Which countries do you think are the hot countries in Asia where you want to target? Where you can get your fastest ROI?

Kelvin Law: There is no doubt it is China. The Chinese are the most fast moving country.

David Werner: Yeah I thought someone would say that but I am trying to figure out about this scalability to the business and to the home because that is where you have absolutely the least control over what goes on. What's your LAN? How's that going to get solved?

Kelvin Law [Kelvin pointed out that prior to China's entry into the WTO there is no direct access to the China market for foreign carriers, so Teleglobe must have partners – JU]

David Werner: Tom, what do you think about China? The same upbeat --

Tom Boasberg: You know I think to the advantage and challenge that Hong Kong has right now is very particularly with telecoms in Northern Asia, North East Asia, that is Japan, Taiwan, Korea and China, you know there is so much more growth there. So many more users than in South East Asia. Seoul in South Korea - that city has more broadband users than all of the ASEAN countries put together. I think we look at those countries. In terms of China, the breakthroughs in China, the challenge I think for all of us is going to be how we capture that growth. How we deal with the situation right now. Up to this point the Chinese Government has been very restrictive with regard to the actual opening and operating of networking infrastructures, as opposed to just providing services over their infrastructures. I think all of us are certainly talking with Chinese carriers about different ways of working together, carrying international traffic, of forming partnerships. So I think that all of us have a great opportunity to deal with China on the wholesale side, which is supplying them with the capacity, working with Chinese carriers. In terms of our ability, when does the day come when we actually get to establish business in Shanghai or Beijing or Guangzhou and go after the customers.

David Werner: Okay and as you said since it doesn't cost that much to lay fibre and not light it, it is not that big a deal if you land there early then - is that the general idea?

Tom Boasberg: Let me show you what I mean. Bandwidth is a limited perishable commodity because the technological thing is that we see a submarine cable laid today will have a much much cheaper unit cost than a submarine cable laid three or four years ago. There is a little bit of perishable element to the submarine market in particular, so the answer is, "Yes" - the bandwidth that we and others have put into place now - when the Chinese market opens out we will soak up more of that. Already some of our biggest customers are Chinese carriers, who we actually meet here in Hong Kong and then take their contents overseas.

Ross O'Brien: I have a couple of points and it seems fairly relevant at this point.

David Werner: While we are on relevancy, Simon and I agree that you have Hong Kong way too far up in the friendly corner of that graph of yours. Okay. Graham if I can ask you a question please? What do you think are the markets these guys should be focussing on? I mean I know it is being totally selfish because stock is cheap now and I want to know where to put my money. Well because you have one of the best overviews of what is happening in each country of anybody I can think of.

Graham: Well I am a little bit confused, or surprised, about the assumption that growth is going to go up, exponentially and forever. I noticed on the OFTA website that as of the beginning of this year the number of Internet users is going down. Registered users. I wonder how much the assumption that growth is going to go up and up and up is actually valid. I understand reports that broadband users may be taking up the slack from the dial up users but still the assumption of everybody so far this afternoon has been that the growth will continue to increase the demand and I am just wondering how valid that is.

David Werner: That's a good point. The reason it is a good point is because when people are giving all these horrific, "We need so much bandwidth" across the world a few years ago I don't think they took into account compression technology and the fact that a .jpeg takes up one to two orders of magnitude less space than a .bmp and, you know, who knows what

guys meant by some of these estimates. Yeah, it is a good point. Can anybody address that? So that you are not two years from now telling us why these two years weren't as good as you thought.

Kelvin Law: [Kelvin argued that it isn't so much how many people are on the Internet but the usage made by those on it. Content, applications, the increasing spread of standards in applications, inter-active TV programming, etc. will drive the demand for bandwidth. The terrorist attacks in the USA has also increased the demand for telecommunications, teleconferencing as people want to fly less – JU].

Participant: A two-ply question to Tom's side. If we assume that C2C comes on next year in Hong Kong how will that impact on the demand for capacity... at what future date do you see the current capacity, unlit though it is, in Hong Kong actually being used. That is question one. Question two raises the other side, is in relation to China. Do you actually see Hong Kong as being a meaningful hub for forwarding that China traffic or is that through direct cabling into China? I know some of the carriers actually have sub-sea cable capped offshore in international waters seemingly waiting for the day when it actually roll it in following Tom's theory of you may as well lay it now because the day will come when you can use it.

Tom Boasberg: Assume that we start at 80 gigabytes - the ultimate capacity is an advertising gimmick. In other words, 3 terabytes or 4 terabytes or 5 terabytes - the marginal cost of putting in extra terabytes is a very, very close to zero. I think, quite frankly, c2c will never be (inaudible), which is by the time you get the kind of capacity or demand ... it will probably be much cheaper to use a new generation of cable which will be two generations on and have enough capacity...

Participant: Depending on what sort of cable... you are talking about in new transition technology with existing optics or are you talking about actually laying a new cable?

Tom Boasberg: It would be laying of new cable. I don't want to get too technical words like -- what really determines the capacity of a cable is you have optical repeaters that are ... inside your cable. The stuff you put on the shore with each new generation ... Once your electronic is sunk we're sunk. So the issue is that every year or two years you are seeing it doubling in the price/performance ratio of optical repeaters. By the time you get to five or six years designated time frame the price/performance of optical repeaters will be so much better that the best thing will just be building a new system... So that if what you're dealing with then, you know, the shelf life of these cables really is optimistically a five to seven year shelf life.

Participant: [repeated the China question – JU]

Dermot Keilthy: [Stressed the importance of diversity of routing from Hong Kong to China, and the fact that Hong Kong was the location of choice of most international operators serving the North Asian markets – JU]

Tom Boasberg: The right answer. I do think though it does not answer my question which is, at this point it costs more to get from the mainland border to Hong Kong than it does to get from Hong Kong to Los Angeles. So, you know, the real role of how effective Hong Kong would be to transport is to let people build. If you don't let people build from the Shenzhen river down to the cable systems in Hong Kong then we have prices that are really high. So that will be the key question for regulation. When you don't want people to build, when you don't have competition, when you close off your market, you have to pay high prices. When we deal with Chinese customers today a lot of them just say it is much cheaper for us to

reach you in Japan and we use Japan as a transit point because using Hong Kong as a transit point trying to go through the oligopoly here is too costly.

David Werner: It is not that people won't be able to do it, it is a matter of timing isn't it? I mean eventually people can build anything they want - is that what is going on? 2003 is just not soon enough? You have enough money to build.

Tom Boasberg: You have seen from an opportunity perspective your chance situation where, in the most capital-rich time in telecoms and financial market history, the capital was available ... It didn't get to come into Hong Kong. Hong Kong said, "Sorry we don't want that capital" Hong Kong is now thinking that maybe next year they will open their market, although lots of caveats. There will be a much more competitive situation next year which is the scarcity that you will see of capital over the course of the next 24 months. It is going to be very difficult... Singapore did exactly what Hong Kong did a few years ago, which was closing off competition to have a duopoly and not to allow for competition. And I think Singapore really changed from all this about 18 months ago. Very profound, very embarrassing for them to say, "We got it totally wrong. What we need to do in Telecom is what we have done in micro electronics and industry which is not to keep capital out, but to do anything we can to incentivise and draw capital in to wholly open the markets" I think if Hong Kong faces the decision over the next few months it will a very important decision for Hong Kong to make, which is does it really want to be welcoming, attracting outside capital in a market where capital is very scarce...?

David Werner: It is pretty hard for me to envision Hong Kong not taking any action when they are effectively admitting they were wrong about it.

Participant: You were saying earlier about existing cables, for customers it makes no sense for them to go on carrier cables of a generation ago. From a technology standpoint, you are right it makes more sense to go with the newer generation, but from a practical business point of view you still get customers in the market specifying which cables they want their traffic to run over and they still, because there is no such thing as a standard master level agreement that cuts across all facilities-based carriers, they go with experience and relationships that have been built. And I guess the comment is how much longer do you think that that mentality in the wholesale market will exist? That carriers and carriers' carriers associate quality with specific routes?

Tom Boasberg: Right... I think that, at this point, because there is specific scarcity of cables, the cable operator and the cable system are one and the same thing. A cable operator has one cable. People, I think, customers don't care about the cable system itself unless it is a notoriously bad system that constantly gets caught because it was laid in particularly shallow and in fishing intensive waters. The key, I think, you are seeing from customers now appears to be quite straightforward. Who is the operator? There are trusted operators provisioning and maintaining a trusted operation to either build a safe dealer system or buy off another carrier. I think the choice of customers will always be with the operator. I think you are right, after all, to say that customers are, and will continue to be, very, very quality conscious about the operations that they chose to provide...

David Werner: Simon, you must speak to a lot of people that major users. It strikes me that at least half the reasons or more about why things aren't going the way everybody expected they should -- they weren't foreseen as far as regulatory, ability to build out, ability to interconnect with homes and all that. What is your take on all of this? What are these guys doing wrong or what should they change? What should these guys do, in your view, representing Hong Kong telecom users to be a better service to Hong Kong?

Simon Chan: [Simon emphasised the problem of local access as remaining a key issue. He also agreed that in the future access to mainland China's market would be key to Hong Kong's carrier businesses, and pointed out how far retail prices had fallen already by around 50% since the 1997 handover of Hong Kong to Chinese sovereignty. It was now a question of having a more 'neutral' wholesale regime to allow carriers to compete for business – JU]

Participant: I don't know who to direct this to but is it reasonable that OFTA will change, speed up anything about their programme to loosen things up in the next couple of years? Or is it just we are all sort of stuck with the agendas that exist?

David Werner: [OFTA official – JU] do you have an idea?

OFTA: I feel if this question is being directed to me it ought to be directed to the gentleman next to me as well from PCWHKT, but I think always the challenge with OFTA is you have to go through certain processes for it be to able to achieve its goals and aims in relation to any connection. I think it is doing that at the moment. There are several determinations it is in the process of deciding. There is always the temptation, I suppose, from the incumbent's point of view to make sure that all the 'Ts' are crossed and the 'Is' are dotted, etc. I think OFTA's really conscious of the fact that it needs to speed up its processes and it's doing what it can do in that regard.

David Werner: How?

OFTA: Well I think first of all it means it has been undergoing particularly in relation to structural issues. It needs to change the structure from the way its got the Director General, I think you will have seen that it is now got a Deputy Director General. It has also started up a Competition Affairs Branch and is actively employing people from both here and Australia. I myself and my colleague were recruited from Australia. I think that is one of the ways to do it is getting on board more resources. And I think trying to improve the quality of its decision making. In fact, I have been there since January and, in the time that I have been there, the legal staff have gone from one to four and I think that has increased as well. If there is an issue in relation to timing of decisions, the first thing you do, I would have thought, was that you try and address that by pouring more resources at it.

Secondly, I think, you look at the way you are doing things and you look at how regulators from other areas do things, such as Australia. Myself and my colleagues are from the Australian Competition Consumer Commission. So you look at how things are being done by other regulators in other areas. The colleague before me came from OFTEL, I believe.

I think thirdly, you start learning from experience here and elsewhere and just try and do things smarter and better. The way you do that is by being resource-intensive and trying to get a bit smart about how you do things. If ultimately there is a need for more and more structure then I think you look at that as well. Obviously, I am just a consultant there, I am not somebody at the level of the Director General that can actually look at the policy issues and I think ultimately it is going to be a question for government as well.

Tom Boasberg: I deal with regulations in every country in the Asia Pacific region. I used to say that Hong Kong was our favourite place to do business and whilst would really like Hong Kong to let us build backhaul facilities and get into building facilities in Hong Kong, there is no other place that I have more confidence in the decisions and more certainty about the outcomes. And certainly, you know, this week (inaudible) Hong Kong on that shot is actually further ahead than lots (inaudible) the same problems with procedures. Australia is up there as being liberal, but maybe the Australian market doesn't work quite as well as it should and perhaps the Hong Kong market is actually working more efficiently because it is a little bit

more heavy handed than the Australian market. I think OFTA is actually doing a pretty good job.

OFTA: I wanted to say two more things that springs to mind in this particular debate. I think as M H Au mentioned there is a consultation paper coming out shortly in relation to these broadband issues and the position of Dermot's company, Reach, and I think I'd encourage industry to participate in that process a lot more vigorously than perhaps the history of Hong Kong in the past. That is an individual view more than an OFTA view.

Secondly I think you should note that these problems aren't Hong Kong specific. If anybody visits the ACCC website at the moment they will see that the regulator there has issued what is called a competition notice against Telstra, requiring it to perform interconnection in relation to ADSL products more effectively and that process will result, if it is proven, in AU\$10 million of fines plus AU\$1 million a day for each time ... So I think it is important to not lose sight of the fact that these issues aren't necessarily confined to Hong Kong.

David Werner: Yeah. John, I have to say it is too bloody hot in here today to have held a good long debate. What kind of issues would you like to hit the floor in wrap up? I'm impressed that there's been hardly anybody sleeping in here. I don't know how they get to do it.

John Ure: Here's some advice. Stand over one of these air vents and you will get cool. Just a comment on the previous discussion, or not a special comment, but I would suggest that one of our future forums - in the very near future - actually be devoted to precisely this issue about change in approach to regulation. And I think I have spoken to Tony Wong about this in the past and I think he would welcome that opportunity.

And just to pick up another point that was made, and it is a reasonable one from OFTA's point of view and that is that often the only people who get really involved in these debates are people who have got an immediate and very, very close interest and in fact there is a much wider community of interest that should be drawn into these debates. Obviously through the forum we try to do that. OFTA runs industrial forums of its own from time to time and I do think that is a very good point and that policy making always benefits as a result of that, so that will be one of the focuses I am sure of a future TIF.

There were two or three questions that came up during the course of the second hour I just wanted to follow up on. One of them was a question of -- the issue of demand. The discussion was primarily based upon the demand from the consumer sector and applications, content, broadband for the home and so on. I'm wanting to ask Simon, in particular, for example in the case of a company like Compaq, what is the kind of demand that a company like Compaq has generated. What are the requirements of the big corporate users going to be? How far are they being met by existing service levels and bandwidth supplies and putting the same question to the operators, the big five providers, how far is corporate demand for data an equally important part of the market to the demand that comes from residential users. In fact, it goes back to the question of segmentation. I mean how far do you segment the market and what is the relative importance of those segments?

Simon Chan: The quick answer. One thing with multinational companies ... their logistics and distribution channels play a very big part in the requirements of their data network. Voice, as you probably know, although it might increase over time in terms of volume per minute, the cost of that has fallen so much that you are not going to gain much out of that. So as I mentioned now we are accessing only one kind of voice distributor. So, if Hong Kong has to continue in this corporate market field, it has to compete for the head position in Asia. For the other type of applications, like real time or other high volume sales, it really depends on the situation, you know... [Simon pointed out that a computer unit does not use

many applications or content like TV or multimedia, but the crucial issue is the integrity of the network, especially to serve remote locations – “so we cannot afford to have much downtime. So that’s the key.”]

Dermot Keilthy: I think for us it’s all corporate really, you know that’s what we’re really interested in and I guess things like IPVPNs and you know those sorts of things we see as driving the market for us ...

Kelvin Law: [Gave the example of India, where consumer content was going to be very important.]

Tom Boasberg: It’s video, especially video on demand, maybe every TV channel is going to be -- you just call up your TV show whenever you want and if you’ve got a proportionate bandwidth its going to shift toward consumer consumption and away from corporate consumption or is that wrong?

Kelvin Law and Tom Boasberg: [Discussed whether or not carriers focusing on corporate business would lose market share measured in bandwidth to carriers who served consumers of content and applications. Kelvin gave India as an example of growing consumer demand, but they could not come to a definite conclusion about the relative growth prospects of these two markets.]

John Ure: Anyway, my impression is that if Reach and Teleglobe are thought of maybe as traditional carriers, and Worldcom and Level 3 are relatively new entrants, the new entrants are more focused on particular -- because I know Level 3 is very focused on the ISP market, Worldcom very much on the corporate market. Teleglobe and Reach have a more diverse customer focus. That raises interesting questions about the future structure of markets. My other question, which I was quite interested to raise, when actually you asked earlier, Dermot, that question about Telstra and reasonably enough he didn’t want to answer the question that was actually asked. But it does strike me as being an interesting link up that for regional companies -- however large the regional company is like PCCW/HKT - HKT before the separation – Singtel, NTT and so on. By global standards they are not world players for the most part. How far, therefore, do any of the panel see the kind of regional link up, the regional alliance -- in this case Telstra, Reach, Singtel has been buying in to a number of companies regionally. How far is that going to be the trend for the future? How far is having end to end connectivity across the Asian region going to be a significant and major trend?

Dermot Keilthy: It’s not something that we would discount, or something that we are interested in at the moment, but if the appropriate circumstances for an opportunity comes up, yes I think we would look very hard at that expanding regional link up that we have. And, I think you will see it increasingly I think, with companies trying to expand through their own direct investment as with Singtel down into Optus. Most companies are looking to try to expand their part in the regional reach, because end to end connectivity is something which is increasingly important rather than just a half circuit market. Customers are looking for end to end connectivity...

Participant: I think it’s vital carriers have contractual relations with each other to do the best they can to get coverage in each country where they are not represented and hopefully things will change in some of the countries. You know, we for example, would like to go into some of the countries we’re not in now but we’d like to go with a 100% owned subsidiary. Everyone here actually has relations with each other in one way or another whether its customers of each other or ... so you know that sort of contractual basis for development of and I think it is the trend that we see in the short term.

John Ure: I'm just wondering whether the regional companies can actually compete with you big guys when you're global? You have relationships, but you own your own facilities.

Participant: We might be Reach's biggest customer in Hong Kong. We will rely on Reach, well we do at the moment. We may not shortly. So these guys are getting lots of money from us. They're doing pretty well.

Tom Boasberg: [Pointed out that still over 80 per cent of traffic from the region goes to the USA but this will change. This will also happen to Internet traffic as intra-regional traffic becomes more important.] ... I think as the internet becomes more regional in content, more of a strength of the regions... I think that in a key challenge going forward it is really going to be for the Worldcoms to develop the strength and the ability to capture that regional traffic in addition to the to and from U.S. traffic and vice versa for the regional players to make partnership and alliances on the U.S. side. I think it would be really interesting to see it 24 - 36 months from now...

John Ure: The other theme there of course was that it's going to be interesting to see is whether national sensitivities stand in the way of possible alliances. I mean we've seen clearly that happen in Malaysia, in Hong Kong and indeed in Australia those issues have arisen so that also will be an interesting test.

1. Another question on bandwidth to China, and Dermot Keilthy pointed out "there's a lot of new cable coming to China because in the last 18 months --18 months ago was probably one perhaps two cables crossing to mainland China. There are now five or six and but there will be mainland China pathways. It's not easy to get the appropriate organisation to build a structure there."

David Werner: Yeah I think we should wind up because it's hot. I am incredibly impressed with everybody sitting up on there -- the light shining down on them, all shiny and sweaty. Thanks a bunch. Anybody have any parting words about Asia? Simon?

1. In summary the speakers made the point that the level of understanding of the issues is far higher in Hong Kong than many other Asian economies, and that OFTA is very accessible.

John Ure: Thank you very much indeed David and all the panel and all of those of you who have stayed on until, I won't say the bitter end, but it was rather sweet and sickly at the end there wasn't it? (Laughter).

Though seriously, I do think this issue that we have just been discussing undoubtedly will be a major focus of a future forum or maybe two or three future forums in one fashion or another. It therefore remains for me to thank very much our panel in the usual way. Thank you very much and to remind you to check out the website www.TRP.HKU.HK/TIF and you can get the presentations and the proceedings will be up there in two or three weeks when I can find the time to get them all done.

Norman do you want to speak?

Norman Wingrove: If anybody here -- talking of the website -- if anybody here has useful links to give us we have been building up a very big library of telecom related links on the TRP site. Any you have to suggest, if you will email them, the best thing is to email them to John because he presumably has his card or his email address and he will pass them to me.

John Ure: Norman, for those of you who don't know is our webmaster, which explains why the site is such a good one. We have a principle that the content is rich, not the clutter around it, so we try and keep it as simple and easily navigable as possible. And if anybody has proposals for future themes, speakers, topics etc, please get in contact with me.

Thank you very much for coming and look forward to seeing you all again. Thank you David.