Response to IDA's Invitation for Comments made in Consultation Paper "Proposed Approach to Fixed-wireless Broadband Network Development and Service Provisioning in Singapore" dated 16 February 2000

a) The potential of and benefits arising from the deployment of fixed-wireless broadband network, the likely services/applications to be deployed and the potential demand from business and consumers.

The fixed-wireless broadband technology can be utilised as the transport medium to eliminate the last-mile bottleneck faced by many entrants in the telecommunications market. With the total control of end-to-end transport medium, fixed-wireless broadband network operator is able to offer a variety of broadband data and voice application to the end customer depending on the amount of bandwidth allocated to operators. Services that can be provided using this transport medium include conventional nxE1 / fractional E1 leased line or ISDN for fast internet access, Frame relay, VOIP, video-on-demand, and other multimedia services that requires broadband capability.

Potential demand is expected to come first from businesses, particularly from the SMEs which is traditionally less well-served by the incumbents as compared to large corporations. It will then gradually proliferate to homes which demand a much faster access speed than conventional 56k or ISDN BRI options. The statistical multiplexing characteristics of LMDS result in efficient spectrum utilization. As a result, operators can readily offer a large range of connection speed (from ISDN to nxE1 connections) to different customers based on their individual needs.

b) i) The possible uses for the fixed-wireless broadband technology, and how the competing demands for the spectrum should be managed, including the allocation process, the timing of the process and criteria to be used.

We agree that possible uses for the fixed-wireless broadband technology are what were stated in para 2.2.1 of the consultation paper. In particular, we expect that the demand for spectrum will come mainly from ISPs or new telecom players using the network as an alternative to fibre, cable and ADSL infrastructure for the provision of fast Internet and broadband access.

With the limited spectrum, the operator that can generate the most demand and hence most efficiently make use of the allocated spectrum should be given priority. The roll-out plan by each operator should be examined carefully – coverage areas, timeline for roll-out, types of services available, business plan to drive up demand, etc. The following are some examples of operators that should be given priority for spectrum allocation:

1) Nationwide coverage as opposed to local/sector specific coverage only;
2) Wide spectrum of services offered as opposed to application or market specific roll-out;
3) True competitive roll-out of LMDS challenging the existing media of services as opposed to incumbent operators using LMDS to complement their existing broadband network.

ii) ***IDA also seeks comments on whether there are interconnection and access issues that may pose problems to achieving IDA's objective of transparent and seamless interconnection and open access; and how these may be practically and realistically addressed.***

We do not foresee any special issues on interconnection and access from the technical perspective. From the commercial perspective, the usual difficulty of reaching a commercial agreement for interconnection is likely to exist. A clearly defined interconnection framework set out and enforced by IDA should be able to minimise such problems.

iii) ***IDA further seeks comments on the type and level of QOS standards, including both network and customer QOS standards, that would be appropriate to benchmark the quality of the network and services deployed.***

Fixed wireless network using LMDS technology had just been deployed in some developed countries such as USA and France recently. We believe that Singapore is the first country in this region (rain region P) to evaluate this technology. Results from field trials should be used as the benchmark for initial QOS standards which should then be monitored and revised if necessary.

c) ***The amount of spectrum that should be made available for terrestrial fixed-wireless broadband and satellite services, including the timing for review of spectrum reservation and allocation, where appropriate.***

Since the band 28.6 – 29.1 GHz is already reserved for use by NGSO FSS networks, we are of the opinion that it should be sufficient. The timing for review of spectrum reservation and allocation should ideally not be shorter than the licence duration awarded.

d) i) ***The optimal amount of spectrum to be allocated to each operator, including the detailed assumptions/basis/calculations used to derive the proposed spectrum bandwidth, and the timing of allocation where appropriate.***

As the LMDS spectrum is primarily reserved for broadband services, each provider should be allocated sufficient bandwidth in order to compete with traditional wireline provider. Currently, most of the vendors' solution can support around 40MHz per sector, 4 sectors per base stations. A reasonable allocation will be two duplex blocks of 160MHz. This is similar to the current spectrum allocation by OFTA, Hong Kong to all successful LMDS contenders.

ii) ***IDA also seeks comments on the optimal number of operators that can be licensed, bearing in mind the growth of the broadband market in Singapore.***

The optimal number of operators is 4. With 4 operators, it is a balance between creating a competitive environment and having sufficient spectrum for each operator.

e) i) The most appropriate licensing and spectrum allocation approach to adopt.

We are of the view that a pure auction-based approach would NOT be an appropriate approach for spectrum allocation. There are many examples in countries that implemented the pure auction-based approach where the incumbent telecommunications operator obtains the spectrum as new players cannot afford to outbid the incumbent operator. One such example is the spectrum auctions taking place in UK. Typically, auctioning will lead to high price of license which will translate to higher cost of service. Ultimately, end users will be the one paying the high price and this will inhibit the penetration rate of broadband users. By introducing more new players into the broadband market, we can expect more innovative and competitive pricing and services which will eventually drive down the cost and drive up the penetration and adoption by the masses.

ii) Views are also sought on whether spectrum should be assigned in a phased manner or allocated fully to the operator at the grant of licence.

Spectrum can be allocated in phases as long as the spectrum allocated in the first phase is sufficient for the operator's needs.

iii) Should there be a separate component for licence fees payable in addition to spectrum fees payable.

Whether there should be a separate component for licence fees payable in addition to spectrum fees payable will depend on the method for licensing. If the method is beauty-contest tender approach, license fees in addition to spectrum fees would be reasonable since the spectrum fees payable would likely be on a cost-plus basis. However, if pure auction-based approach is adopted, the spectrum fees would likely be significantly high assuming that there are significant number of contenders for the limited spectrum, driving up the bidding price. If licence fees are payable in addition to spectrum fees, then the barrier to entry will be very high with this high up-front cost, hence further deterring new players from entering the market.

f) Whether the proposed spectrum band should be reserved primarily for IBBMM services or whether they should be assigned for broadcasters' usage.

We are of the view that the proposed spectrum band should be reserved primarily for IBBMM services rather than for broadcaster's usage as the existing analog TV spectrum (VHF and UHF) can be released for broadcasting purposes.

g) The appropriate licence duration for the provision of fixed-wireless broadband services.

We are of the opinion that the licence duration for the provision of fixed-wireless broadband services should be 15 years to allow operators enough time to roll-out and establish the network and services and also for return of investment because of the big infrastructure investment.

h) ***The timeframe for award of licence as well as the time needed by the operators to roll-out their networks and offer commercial services to the public.***

Since the LMDS trial will end by end July 2000, the award of licence in 3rd quarter of 2000 would be timely.

Roll-out should be carried out in phases starting with CBD area to bring broadband access to businesses at competitive pricing to drive the goal of turning Singapore into an ecommerce hub. The next phase will then be private and public housing, the sequence to be determined by the concentration of population in each area through proper cell planning.

i) ***How the issues of rain attenuation and compliance with QOS standards be addressed.***

In general, the lower the frequency used, the less sensitive to rainfall. The ideal range of frequencies that will help to minimise impacts of rainfall can be determined during the field trials. Proper cell planning will be key to address the rain attenuation and QOS issues.

j) ***How operators plan to install their own internal wiring, the potential difficulties faced and the cost of doing so. IDA also seeks comments on how these difficulties can be practically and realistically addressed by potential operators and how IDA can facilitate the installation.***

There are several ways to reach the customers located at different levels within high-rise buildings:

1) Lay in-building wiring to customers when signing up customers;
2) Pre-lay in-building wiring in new buildings at time of construction;
3) Wireless LAN solution within building;
4) Lease unbundled local loop from incumbent.