

SUNDAY Holdings (Singapore) Corporation

Response to the proposed policy approach to 3G infrastructure sharing in Singapore

1st February 2002

1. Introduction

SUNDAY is one of the six mobile operators in the Hong Kong market. It launched commercial GSM 1800 operations in 1997. It was one of four operators who recently acquired a 3G licence during Hong Kong's September 2001 3G auctions. It is widely considered to be one of the most innovative and creative mobile operators in Hong Kong and the region.

The company is listed on the Nasdaq (SDAY) and the Stock Exchange of Hong Kong (0866). Key shareholders include Distacom Communications (46.2%) and USI Holdings (11.5%).

Prior to the Singapore 3G auction in 2001, SUNDAY made public its intention of bidding for the fourth 3G license and had drafted detailed business plans for the venture. However, due to the prevailing market conditions it decided to withdraw its plans at a relatively late stage in the process. The company, however, publicly remains interested in the possibility of providing 3G services in Singapore.

2. Responses to the IDA questions

We understand that deployment of 3G networks in Singapore is still at the planning stage. The IDA is keen to facilitate the early and rapid development of 3G services in Singapore but recognises that there are a number of potential obstacles to this objective. As a consequence, the IDA has invited interested parties to comment on the possibility of infrastructure sharing in Singapore.

Before reviewing the IDA's specific questions, it is worth identifying the guiding principles that should be used to frame any specific regulations or rulings:

- Infrastructure sharing can bring material benefits to both consumers (lower prices) and operators (lower costs);
- Infrastructure sharing arrangements should not disadvantage any existing operator;
- Infrastructure sharing arrangements should not disadvantage any future new entrant to the market; and
- Infrastructure sharing should not be allowed to encourage anti-competitive or collusive behaviour.

The specific answers to the questions presented by the IDA are addressed in order below.

- (a) *Is the deployment of 3G facing delays due to unforeseen difficulties, including the availability of funding and technology? Would infrastructure sharing alleviate these difficulties?*

Delays in the deployment of 3G systems can be traced to a number of unforeseen difficulties and the resulting changes in operator strategies. These include:

1. Slower than expected roll-out of key technology primarily resulting from a number of software and hardware problems. In particular, the development of handsets capable of delivering data rich services has been far slower than previously anticipated. Handset manufacturers have experienced significant difficulties in developing handsets capable of delivering data rich services. Specific problems include heating of the battery, short battery lifetimes and problems associated with transferring data calls between base stations. In addition, a number of operators undertaking trials of 3G networks have experienced software problems with their base stations. These issues had been unforeseen by the mobile operators when they initially developed their 3G business cases and bid for the licences. Infrastructure sharing will not alleviate technical problems but will help with network and handset deliveries since a combined entity will have more market power than the individual operators;
2. Excessive optimism during the technology bubble which resulted in launch dates being announced that were earlier than possible. Early predictions that 3G services would be provided on a large scale from 2001 have proven to be extremely optimistic. Most analysts and commentators now suggest that the commercial provision of 3G services will not occur on a large scale until 2003. Again, infrastructure sharing will not change management sentiment to 3G, but it will make it easier for operators to commit to launch timetables;
3. Funding is a more difficult issue. For many markets and operators, we do not consider funding to be a significant impediment to the actual deployment of 3G networks. However, it is clear that funding problems have prevented a number of operators from either bidding for licenses or have reduced the number of potential operators in certain European markets. Larger operators have continued to benefit from the availability of vendor financing and have found it easier to secure financing than new entrants and smaller operators, although the cost of financing for all operators has increased over the previous twelve months. With respect to Singapore, we do not believe that funding will significantly delay the deployment of networks by the existing incumbents, although without infrastructure sharing, their capital expenditure will be significantly higher. However, the funding environment is not yet conducive to a new entrant. Infrastructure sharing, therefore, will improve funding prospects for all players – incumbents and new entrants;
4. New commercial strategies on the part of mobile operators who are responding to the technological and financial problems described above plus slower than expected consumer demand for mobile data services. Operators are also more aware of the capabilities of 2.5G networks vis-à-vis current demand for data services. As a consequence, many are pushing back 3G network deployment or are deploying in only a few select areas of potential high demand for data-rich services. Infrastructure sharing will have a significant impact on operators' business cases allowing them to commit to faster and more extensive roll-out than otherwise permissible.

There is no doubt, therefore, that 3G infrastructure sharing would mitigate a number of these concerns. In particular, despite technological delays infrastructure sharing would ensure that consumers would have quicker access to new 3G networks at

theoretically lower prices. Furthermore, in Singapore, infrastructure sharing, if implemented sensibly, will increase the likelihood of a new entrant to the market.

- (b) *What are the potential benefits arising from 3G infrastructure sharing that would accrue to our telecommunication industry as a whole and to consumers? Would infrastructure sharing actually lead to faster and better 3G services and if so, how?*

The importance of 3G network costs

The capital expenditures associated with building a 3G network can be highly significant and represent the majority of total expenditure involved in the launch of a 3G business by many network operators outside of Europe. Furthermore, the maintenance of networks can also be considered an extremely significant component of operating expenditure.

International trends

A number of 3G licences, primarily in Europe, were sold at very high levels resulting in subsequent financial duress for operators. The costs of deploying 3G networks are also expected to be significant resulting in further financial pressures on operators. Therefore, there are increasing concerns that operators will not be able to recoup these costs especially as potential demand for mobile data rich services remains to be proven. Responding to these concerns and pressures, many operators have sought to identify ways in which the costs of providing 3G services and products can be reduced.

Sharing of infrastructure, in particular, has proved an attractive proposition to a number of operators, especially in Europe. European regulators have subsequently become involved in the process. In March 2001, responding to concerns that new entrants would be prevented from providing 3G services due to high network costs, the European Commission called on operators to build networks together and in particular, to offer infrastructure sharing to new entrants and, therefore, improve the competitive environment of many European markets. A number of European approaches are detailed in table 1.

Table 1: Examples of infrastructure sharing partnerships

Country	Involved parties	Regulatory position
Germany	Deutsche Telekom and Viag Intekom	Germany regulator allows sharing of operators' sites, antennae and base stations
Germany	E-Plus and Group3G	As above
Sweden	Svenska UMTS (Telia & Tele2)	Swedish regulator allows infrastructure sharing if: first, each operator has 30% of the population covered by its own network; and second, the only infrastructure that can be shared is the radio path (antennae, cable, base station electronics and power devices)
Sweden	3G Infrastructure Services (Europolitan, Hi3G and Orange Sverige)	As above
UK	one2one and mm02	Regulator is supportive of network sharing 'as long as it does not affect competition'

Sweden provides a good example of infrastructure sharing. Three Swedish 3G licensees have collaborated through the company '3G Infrastructure Services'. Under this collaboration, the three operators will construct their own networks in the main metropolitan areas (Stockholm, Gothenburg and Malmo) but will share infrastructure in the less populated areas outside these cities. This arrangement will allow the Swedish operators to meet the regulatory requirement that collaboration is not allowed beyond 70% of the entire network as detailed in table 1.

Applicability to Singapore

To some extent the Singapore market situation is very different from the European markets. The Singapore 3G licence winners were not caught in a fierce auction bidding war and as a consequence acquired their licences relatively cheaply on an international scale. Therefore, there may be some justification that the existing incumbents may be under less financial duress with subsequently less pressure to share networks as a cost saving mechanism.

But the fundamental point is that Singapore is a small market. Although competition may result in significant benefits to the consumer, the size of the market means that unless alternative structures are put in place, operators will struggle to remain financially viable or to create a successful 3G business case, especially as demand for data rich mobile services remains to be proven.

The potential savings from the sharing of infrastructure would significantly enhance the viability and returns from 3G in Singapore. This will actually allow service and price competition to be more vigorous. As a consequence, we believe that infrastructure sharing is necessary for the successful development and provision of data rich services and products and would provide important benefits to both the operators and to the consumers. These benefits are detailed below.

Benefits to operators

The most important benefit for operators is that the sharing of infrastructure is expected to yield significant cost savings to all parties involved. This has been shown through the European experience, where a number of European operators have claimed that they could save 30% on the cost of 3G roll-out through the sharing of equipment and could make further savings if they were able to share core networks.

Specifically, it has been reported that German operators believe that can reduce their infrastructure costs by up to 50% through sharing. In Sweden, Tele2 originally planned to spend SKr14bn (S\$2.4bn) on rolling out its 3G network but through the Svenska JV with Telia, it is estimated to have reduced its 3G network expenditure to less than SKr7bn (S\$1.2bn). The German operator Group3G estimated that its sharing agreement with E-Plus would result in capital expenditure savings of 40% over the next ten years.

The importance of reducing costs is extremely important given the recent increases in the cost of capital that mobile operators now face when raising capital. Increased investor concern over the viability of 3G products and services has resulted in higher costs of capital. All operators face this constraint, but smaller operators and new entrants are particularly disadvantaged. However, given the general increases in the cost of capital, it is in the interests of all operators to seek to reduce the extent to which they have to raise capital and network sharing allows them to achieve this.

Depending on the networking sharing methodology adopted in Singapore (as discussed later), proportionate cost savings could be as significant as the examples cited above. It would be expected that the resulting cost savings would result in lower debt levels and the improved financial viability of the 3G licensees in Singapore. This remains critically important. Singapore remains a relatively small market and a 3G business case remains unproven. This would also make it more likely for a potential new entrant to enter the market. The business case for such an operator would be significantly improved if network sharing occurred and the operator was able to participate.

Operators would also benefit from reduced network redundancy. This means that they would not suffer from the potential opportunity cost involved in rolling out networks which are not significantly utilised until later stages of market development. This benefit would be particularly significant in the early years of deployment when the focus is on coverage.

In addition, early deployment of a network would allow operators to start delivering mobile data rich services sooner and recover some of the costs associated with winning the licence and building the appropriate network. The longer it takes for operators to start recovering the costs incurred in the winning of a licence and subsequent network deployment, the lower the rate of return that the operators will enjoy from this business and the less the potential viability of the business case.

Consumer benefits

Consumers will benefit from network sharing in a number of ways. These are detailed below:

First, and as detailed above, the expected cost savings would be expected to result in a more enhanced data environment for consumers. Operators would be able to use cost savings to develop more innovative products and services for consumers. Competition with respect to service provision would be expected to be significantly more intense as operators substitute competition at the infrastructure level with competition at the service level. If the regulator is concerned about the development and growth of mobile data rich services, then this is clearly a more appropriate framework to achieve this objective.

Second, competition in the 3G / mobile data market will be more intense as more operators will have access to the necessary infrastructure from the outset. Therefore, the first operator to have a 3G network in operation will not be able to maintain a monopoly position in the market. Nor will operators be able to use coverage quality as a differentiating factor. It is clear, therefore, that operators will seek to differentiate themselves in the market through the rapid roll-out of innovative products and services.

Third, alongside service competition, increased price competition is expected. Average service and product prices for consumers would be expected to be lower in sharing than in non-sharing environments.

Fourth, 3G infrastructure sharing would benefit a new entrant into the Singapore market which, in turn, would further increase competitive pressures. Building an entire 3G network would represent a significant additional expenditure for any new entrant and would significantly reduce its financial viability, especially as it has to be

assumed that such a new entrant would only be able to command a relatively small market share. The possibility of infrastructure sharing, therefore, would aid the launch of a possible new entrant and further enhance the competitive environment.

In summary, we believe that infrastructure sharing would neither impact adversely on competition levels nor would it adversely impact the quality of service provided to the consumer. Although operators would not be able to compete with respect to service coverage the entire point of 3G is that the technology allows faster download speeds and consequently, increasingly data rich services to be delivered to handsets. Infrastructure coverage may have been an important issue in the initial 2G environment, but we firmly believe that service and product development will be significantly more important in the new 3G environment. This is where the competitive differentiating factors will be defined and infrastructure sharing would allow this environment to be more quickly achieved.

Environmental benefits

Furthermore, it is also important consider the environmental benefits from infrastructure sharing. There is growing concern that the development of 3G networks will result in a significant increase in the number of base stations required to provide the necessary services and coverage. Estimates of the required number of base stations in a 3G environment depend on a range of issues including the topography, population density and projected take up of data services. However, it is increasingly accepted that a 3G network will require between two and four times as many base stations as in a 2G / 2.5G environment.

The recent growth in the number of base stations has coincided with increasing concerns over the radiation emissions from base stations. Although not proven (in fact numerous studies have shown that radiation concerns remain misplaced with emission levels well within acceptable levels), this concern creates increasing pressure to regulate the spread of base stations. In March 2001, the UK government announced a series of changes to the planning system on the siting of masts, but this has not prevented continued general concern. Fears that the total number of base stations required in the UK in a 3G environment may be as high as 60,000 simply serve to reinforce environmental concerns.

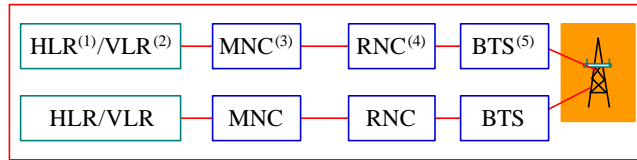
In Singapore, it is estimated that the roll-out of 3G networks may result in a significant increase of base stations. Singapore has a high population density and this may result in a surge in the number of base stations required to meet data demand. Infrastructure sharing, however, would be expected to significantly reduce the total number of required new base stations. The exact reduction in the number of base stations will of course be dependent on the nature of network sharing, but whichever methodology is adopted, the number of base stations may be reduced and subsequently, consumer concerns over the potentially associated environmental concerns.

- (c) *What would be the appropriate type, nature and extent, and timing and duration, of infrastructure sharing?*

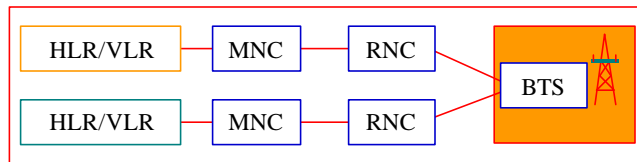
There are a variety of potential options with respect to the nature and level of infrastructure sharing. These are detailed in figure 1.

Figure 1: Levels of network infrastructure

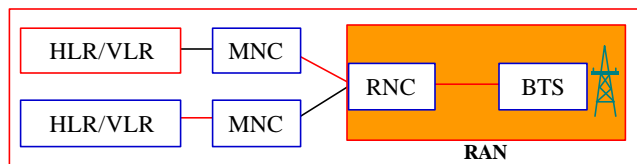
(a) Site sharing



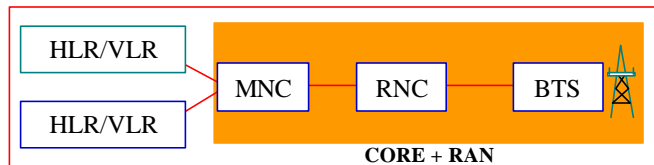
(b) Base station sharing



(c) RAN⁽⁶⁾ sharing



(d) Complete network sharing



Notes:

(1) Home location register (2) Visitor location register (3) Mobile network controller (4) Radio network controller (5) Base transceiver station (6) Radio access network

At its most simple form (a), network sharing can simply provide for the sharing of sites, premises and masts. Although this provides minimal cost savings, it does result in significant environmental gains. The next level (b) is that operators share sites, masts, antennae and the base transceiver stations. At a yet more advanced level (c), operators share all components of the radio access network, and the most extreme level of sharing (d), is for the operators to share the radio access network and the core network. For the sharing operators, this becomes a quasi-MVNO relationship.

The regulator can specify the level at which sharing is allowed. In Norway, for example, the 3G operators are required to place network equipment on common sites. Similarly, the German regulator (Reg TP) concluded in June 2001 that it would allow a limited degree of network sharing. Specifically, it would allow operators to share base stations, transmitters and controllers, but not the core network, i.e. the switches. As a consequence, E-Plus and Group3G recently announced that they would share

sites, antennae, BTSs and radio network controllers. The regulator claimed that to share at the core level would result in serious competition issues. Similar, the Dutch regulator has permitted limited infrastructure sharing at the RAN level.

Potential sharing of the RAN is being aided by the vendors themselves. Both Nokia and Ericsson offer multi-operator radio access systems. Nokia's system, for example, enables 3G network sharing by several operators while still retaining control over their individual licensed frequencies, radio cells, and services. They share individual network elements like Radio Network Controllers (RNCs) and Base Stations. However, since the operators continue to use their own frequencies, they also have their own Mobile Network Codes, which the RNC uses to route traffic to the right core network, which are operator specific.

With respect to Singapore, it is clear that the greater the number of network components that an operator is allowed to share, the greater the resulting cost savings. It is estimated that a typical radio access network typically accounts for 80% of total 3G network costs. Of this 80%, 60% is accounted for by the active base station elements and 20% by the passive components such as the towers. The remaining 20% of total network costs are accounted for by the core network components. Operators, therefore, are often particularly keen to share the radio access network.

Furthermore, there may be significant differences in the desired depth of network sharing between operators. Incumbents, for example, may be content to just share base station sites and equipment. In contrast, however, the financial viability of smaller players in the Singapore market would be enhanced if sharing was allowed to at least the RAN level, although as detailed below, it is recognised that this may result in regulatory concerns over competition issues.

Many commentators, especially the vendors, view network sharing as a short-term phenomenon. It is anticipated that although operators will use network sharing to quickly achieve coverage and to meet regulators' roll-out timeframes, shared networks will experience capacity constraints more quickly and operators may build out their own 3G networks. Regulators can ensure that this is a short term phenomenon by mandating a specific period of time over which sharing is allowed.

We believe that the regulator should permit infrastructure sharing up to and including the RAN level (option c). However, specific infrastructure sharing details are best defined through commercial negotiations within the time frame provided by the licences. We believe, therefore, that network sharing should not be defined in detail by the regulator but left to market forces. This may result in the build-out of either one, two or three 3G networks, but it is important to stress that if the three operators do collaborate to build just one network, then the regulator should not intervene to prevent this collaboration. Once sharing plans are agreed, they should require regulatory approval based on the principles set out here.

If the existing three incumbents do undertake some form of agreement or collaboration to jointly develop a 3G network, then it is essential that such an agreement does not adversely affect any of the incumbents nor constitute an impediment to the entry of a possible fourth 3G licensee. A new entrant in the Singapore market may improve the competitive environment to the subsequent benefit of consumers. Conversely, therefore, the lack of a new entrant in the Singapore market could affect the development of new data services and weaken the growth of take-up to such services.

Infrastructure sharing should be accessible by all operators. For example, it should not provide an opportunity for two operators to collaborate and cause the third operator to operate on a disadvantaged basis. We recommend, therefore, that all operators are allowed (on an 'one-off' basis) access to network sharing on the same commercial terms. However, if the third operator should wish to opt out then the collaborating partners are under no obligation to share facilities with the third operator at any later point.

It is also imperative that the regulator allows for a potential new entrant to be able to benefit from network sharing in the same manner as the existing three operators. We recommend, therefore, that any sharing agreement has to incorporate the possibility of an additional operator using the same infrastructure. Therefore, if two operators collaborate (with the third declining) then they should provide for the possible use of their shared network by the fourth new entrant. Similarly, if all three operators collaborate, then they should also provide for the possibility that they may have to provide access to the new entrant. This should be clearly specified by the regulator at the outset of any permission to allow network sharing between operators. This is possible through the multi-operator RAN network systems being offered by the major vendors.

We believe that any new entrant who acquires the fourth licence should initially undertake commercial negotiations with other network operators. However, the regulator should be prepared to intervene in the market if it feels the fourth licensee is being deliberately constrained from entering through the market through the lack of network sharing arrangements. The expectation is that such intervention would result in the new entrant being offered access on the same commercial terms as the existing participants.

- (d) *Would any potential competition concerns arise with infrastructure sharing? If so, how should such competition concerns be addressed to ensure that there is no adverse impact to consumers' benefits in terms of choice of service provider, access and availability of services, as well as the range and quality of services and pricing?*

Infrastructure sharing has been associated with increasing concerns over competition. For example, a number of European regulators have expressed concerns that the level of 3G sharing may reduce the level of competition in a market. In particular, there are concerns that the sharing of RAN may reduce competition with respect to coverage and quality of service and, therefore, reduce the incentive to produce high quality service coverage to subscribers.

These concerns have also been expressed by a number of incumbent operators. In 2001, the Chairman of Mannesmann Mobilfunk claimed that co-operation with respect to infrastructure sharing would be a 'brake on competition' and would threaten the competitiveness of his company. However, there is of course an element of self-protection in such claims. The incumbents are clearly not particularly enthused by the prospect of new competition in their markets which is the very reason why regulators should look to network sharing to inject further competition into the market.

As highlighted above, we do not believe that infrastructure sharing would impact adversely on competition levels and nor would adversely impact the quality of service provided to the consumer. Although operators would not be able to compete with respect to service coverage the entire point of 3G is that the technology allows faster download speeds and consequently, increasingly data rich services to be delivered to

handsets which is where operators will seek to competitively differentiate themselves. Although, it is true that it is competition at the infrastructure level which has driven improvements in networks and coverage in the 2G / 2.5G environment, we believe that if the regulator remains concerned over the level of network coverage and service quality, these concerns can be resolved through mandated coverage objectives and associated timeframes.

Furthermore, to some extent, competition concerns have been mitigated by regulators mandating that network sharing should only be undertaken with components of the RAN, rather than the more fundamental core network components. The RAN is only an important differentiating factor in early stages of network roll-out, but once coverage achieves close to 100% at an acceptable consistent standard, then it is other issues which increasingly represent the key competitive differentiating factors. Finally, all of the existing anti-competition provisions defining conduct in the industry should remain in force to guard against any possible abuse of position.

We believe, therefore, that infrastructure sharing will not impact adversely on the levels of competition. Infrastructure sharing will result in less competition at the infrastructure level, but sharing should result in significant improvements in service level competition. This will mean that consumers will benefit overall if infrastructure sharing between operators is allowed.

- (e) *What are the monitoring and enforcement issues that may arise on the extent of infrastructure sharing to be established and their scale-back? What would be appropriate monitoring criteria to ensure that infrastructure sharing takes place in accordance to an approved network? How should scale-down of the infrastructure be monitored?*

We believe that network sharing should be undertaken through commercial negotiations, although with safeguards to ensure that a new entrant is not prevented from having the opportunity of sharing networks. Similarly, the most effective monitoring of infrastructure sharing arrangements should be undertaken by the involved parties. In this context, the role of the regulator would be to provide an effective dispute resolution procedure should the parties involved in the arrangement come into dispute.

All scale-down processes should be left to commercial negotiations, unless the regulator mandates a particular date after which operators should have their own networks. In this case, we recommend that the regulator provides a clear date from which all network sharing agreements would be void. Provided this date was given with significant advance notice, the responsibility would be placed on the operator to ensure that they had complied by that date or face the subsequent problems of not having adequate network coverage. However, it is important for the regulator to recognise that such a process may be extremely problematic for the mobile operators. Industry visibility and a coherent regulatory framework, therefore, are essential.

Furthermore, we would recommend against setting a date for scale-down until after it is clear how large demand for 3G networks and services will be.

3. Key conclusions

In summary, SUNDAY believes the following

- Infrastructure sharing would result in significant benefits for consumers:

- it would allow significant cost savings for the operators which could be used to develop and introduce more innovative 3G products and services;
 - it would not result in any significant decline in competition, since the reduction in infrastructure competition would be more than off-set by increases in competition at the service level
 - as well as enhancing the business case viability of incumbents, it will also improve prospects for any potential new entrants which would further increase levels of price and service competition in the market with further benefits to the consumer; and
 - it would ensure significant environmental benefits;
- The regulator should permit operators to share infrastructure to the RAN level, although the specific details of the sharing should be left to commercial negotiations;
 - However, the regulator should mandate that all network sharing agreements include the provision that the agreement should be available to any incumbent and any future new entrant that wishes to participate on a one-off ‘take-it or leave-it’ basis on identical commercial terms, i.e. if two operators share, then their RAN should be designed to allow for an upgrade to three operators;
 - Any disagreements between operators, including a new entrant, should be subject to the same IDA dispute resolution procedures as detailed in the IDA’s Code of Practice;
 - The duration and monitoring of the infrastructure sharing agreement should be defined and undertaken by the involved parties, with potential access to the IDA’s dispute resolution procedure if there are any disagreements between the parties; and
 - The regulator should not set a time limit with respect to infrastructure sharing until 3G demand can be gauged more accurately.

4. Correspondence

All correspondence regarding this submission should be directed to:

Bruce Hicks
 13th Floor East
 Warwick House
 TaiKoo Place
 979 King’s Road
 Quarry Bay
 Hong Kong

Direct Tel: +852 2113 6868
 Fax: +852 2113 4427