

**SUBMISSION OF SINGAPORE TELECOM MOBILE PTE LTD**

**THE PROPOSED POLICY APPROACH TO 3G INFRASTRUCTURE  
SHARING IN SINGAPORE**

**1 February 2002**

## **1. INTRODUCTION**

- 1.1 Singapore Telecom Mobile Pte Ltd (**SingTel Mobile**) welcomes the opportunity to submit our views and comments to the Info-communications Development Authority of Singapore (**IDA**) in relation to the industry consultation paper on the proposed policy approach to 3G infrastructure sharing in Singapore.
- 1.2 SingTel Mobile is licensed to provide mobile telecommunications services in Singapore and has successfully acquired a 3G Spectrum Right and a 3G FBO license. SingTel Mobile is committed to the provision of state-of-the-art mobile telecommunications technologies and services in Singapore. As a leading provider of mobile telecommunications services and a leading proponent of innovation and competition, SingTel Mobile has a strong interest in effective pro-competition regulation of Singapore's telecommunications industry.
- 1.3 Effective competition in the mobile telecommunications industry in Singapore has been established through the principle of infrastructure competition, enabling end users to benefit from increased services, lower prices and the ability to take service from an alternative mobile telecommunications supplier. This model of competition has meant that the mobile market has been able to provide end users with dynamic competition through the process of new service development and innovation. With vigorous competition in the mobile market, new service development and innovation is essential to maintaining competitiveness. The licensing of 3G mobile spectrum was based on a similar principle of infrastructure competition.

## **2. EXECUTIVE SUMMARY**

- 2.1 Our views and comments may be summarised as follows:
  - SingTel Mobile believes that the current infrastructure sharing approach is sufficient and appropriate. A more comprehensive 3G infrastructure sharing approach will give rise to significant commercial, technical and operational issues.
  - Whilst the Singapore economy has been adversely affected by the worldwide economic downturn, the incumbent mobile operators are not burdened to the same extent as some of our overseas counterparts. Nevertheless, the incumbent mobile operators paid a significant amount for the 3G Spectrum Rights and will be required to make substantial investments in 3G network infrastructure over the coming years.
  - 3G network deployment is facing potential delays for a number of reasons including:
    - the late and numerous changes to the standardisation of 3GPP;

- delays in 3G terminal development and availability due to the complexity of the terminals;
  - lack of market readiness due to the slow development, growth and adoption of GPRS services.
- The primary objective of infrastructure sharing is to reduce costs. The incumbent mobile operators have already fully deployed existing mobile networks in Singapore and are able to leverage on this existing mobile infrastructure in order to deploy their 3G network infrastructure. A more comprehensive 3G infrastructure sharing approach gives rise to significant commercial, technical and operational issues and is unlikely to deliver significant benefits to the industry or end users, nor will it address the issues faced by the incumbent mobile operators.
  - A more comprehensive 3G infrastructure sharing approach involving site sharing, radio network sharing, geographical network sharing or total network sharing will not necessarily result in “faster” or “better” 3G services due to the complexity of the commercial, technical and operational issues involved.
  - Competition in the mobile telecommunications industry in Singapore has been established through the principle of infrastructure-based competition. A movement away from infrastructure-based competition may have competitive effects. The existing competition framework is sufficient to address any potential anti-competitive behaviour, however, the overall effects on competition arising from reduced infrastructure competition cannot be addressed through regulation. Regulation is a poor substitute for the operation of market forces and there is considerable risk that regulatory intervention would distort the development of the market.
  - We recommend that the IDA provide the incumbent mobile operators with the necessary flexibility and facilitate the deployment of their 3G network infrastructure and services by:
    - Removing the requirement to deploy a nationwide 3G network by end-2004, thereby enabling the incumbent mobile operators to make economically rationale and efficient decisions with respect to their investment in 3G network infrastructure and the roll-out of 3G network infrastructure and services. In the event that the IDA is not inclined to completely remove the regulatory requirement, we would recommend that the IDA remove the “nationwide” coverage requirement.
    - Strengthening the framework applicable to in-building facilities to enable the mobile operators to obtain efficient access on reasonable terms and conditions.

- In the event that the IDA is inclined to adopt a more comprehensive 3G infrastructure sharing approach, regulatory intervention should be kept to a minimum. The mobile operators should be allowed to negotiate and agree the commercial, technical and operational arrangements without IDA intervention. The IDA should not intervene to determine the commercial, technical and operational arrangements.
- In the event that a more comprehensive 3G infrastructure sharing approach is adopted, the mobile operators who engage in more comprehensive infrastructure sharing should be required to submit detailed 3G network roll-out plans to the IDA for approval. The role of the IDA should be limited to monitoring compliance of the mobile operators with the approved 3G network roll-out plans.

### 3. VIEWS AND COMMENTS

3.1 The IDA has sought views and comments with respect to the following:

(a) *Is the deployment of 3G facing delays due to unforeseen difficulties, including the availability of funding and technology?*

3.2 As the IDA has correctly identified in its consultation paper, the excessive over-bidding for Third Generation (3G) spectrum in the European auctions has placed many successful bidders under severe financial strain. This financial strain has been compounded by the worldwide economic slowdown and the revaluation of telecommunications related companies and industries. This has led telecommunications companies and regulators alike, exploring ways and means of reducing the cost burden associated with deploying 3G network infrastructure.

3.3 In the context of Singapore, whilst the Singapore economy has been adversely affected by the worldwide economic downturn and the telecommunications industry has felt the effects of the revaluation of telecommunications related companies, the incumbent mobile operators are not burdened to the same extent as some of our overseas counterparts. However, whilst the incumbent mobile operators were able to obtain 3G Spectrum Rights and 3G FBO licenses at the minimum reserve price, thereby avoiding excessive over-bidding, the price paid was nevertheless significant. Furthermore, the incumbent mobile operators in Singapore will be required to make substantial investments in 3G network infrastructure over the coming years in order to meet the regulatory obligations imposed by the IDA.

- 3.4 Whilst funding is not expected to be as significant an issue as in other jurisdictions, the incumbent mobile operators are confronted with other barriers in terms of the deployment of 3G network infrastructure and services in Singapore. The deployment of 3G network infrastructure is facing potential delays for a number of reasons including:
- (i) 3G technology standardisation;
  - (ii) 3G terminal development and availability; and
  - (iii) market readiness.
- 3.5 There are late and numerous changes to the standardisation of 3GPP. For the 3GPP Release 99 version, there were releases in December 2000, March 2001 and the latest in June 2001. The 3G equipment vendors will only be ready to conduct interoperability tests (IOT) from June 2002 onwards. This may cause delay in the deployment of 3G network infrastructure.
- 3.6 The development and availability of 3G commercial terminals is also facing possible delays. This is due to the complexity of the terminals as the terminals will be required to be dual-mode in order to support both 2G and 3G networks. Further, the terminals will also be required to support much higher data rates in both circuit and packet calls.
- 3.7 The development, growth and adoption of GPRS services worldwide have been slow. This has prompted mobile operators worldwide to revise their strategy and the timing for their 3G network infrastructure roll-out.
- 3.8 In summary, the deployment of 3G network infrastructure and services is facing potential delays. Whilst funding is an issue, 3G technology standardisation, 3G terminal development and availability and market readiness are also sources of potential delays in the deployment of 3G network infrastructure and services.

**(b) *Would infrastructure sharing alleviate these difficulties?***

- 3.9 The primary objective of infrastructure sharing is to reduce the costs associated with deploying 3G network infrastructure. However, the incumbent mobile operators have already fully deployed mobile networks in Singapore. As such, more comprehensive 3G infrastructure sharing between the incumbent mobile operators is unlikely to deliver significant benefit to the industry or end users, nor is it likely to address the other issues faced by the incumbent mobile operators identified in (a) above.

- 3.10 As we have indicated in (a) above, there are three (3) main issues confronting the incumbent mobile operators which relate to the standardisation of 3G technology, the development and availability of 3G terminals and the readiness of the market given the slow development and adoption of GPRS services. A more comprehensive 3G infrastructure sharing approach will do little to address these issues.
- 3.11 Furthermore, the incumbent mobile operators have already fully deployed mobile networks and will be able to leverage on their existing mobile network infrastructure when deploying their 3G network infrastructure. As such, it is unlikely that more comprehensive 3G infrastructure sharing between the incumbent mobile operators would deliver significant cost savings.
- 3.12 As the IDA has identified in its consultation paper, there is an existing infrastructure sharing framework. Consistent with a infrastructure-based approach to competition, facilities-based licensees like the incumbent mobile operators are only required to share infrastructure designated as Critical Support Infrastructure (CSI). The framework governing CSI is contained in Section 6 of the Code of Practice in the Provision of Telecommunications Services (the **Code**). The incumbent mobile operators currently share CSI infrastructure for coverage in the Mass Rapid Transit and underground road tunnels. In addition to sharing CSI, the incumbent mobile operators share other infrastructure on commercially negotiated terms and conditions including towers and in-building antennae.
- 3.13 In light of the above, we are of the view that the current infrastructure sharing approach is appropriate and sufficient.
- 3.14 We would, however, recommend that the IDA adopt other measures to assist the incumbent mobile operators. To provide the incumbent mobile operators with the necessary flexibility and to facilitate the deployment of their 3G network infrastructure and services, we would recommend that the IDA:
- (i) Remove the end-2004 Nationwide Network Roll-Out Requirement
- 3.15 As we have highlighted in (a) above, the incumbent mobile operators are faced with possible delays related to the standardisation of 3G technology, the development and availability of 3G terminals and market readiness given the slow development and adoption of GPRS services. Removing the IDA requirement for the mobile operators to deploy a nationwide 3G network by end-2004 will enable the incumbent mobile operators to make economically rationale and efficient decisions with respect to their investment in 3G network infrastructure and the roll-out of their 3G network infrastructure and services.

- 3.16 The incumbent mobile operators have commercial incentives to invest in 3G network infrastructure and roll-out 3G services in order to recover the significant costs associated with the acquisition of the 3G Spectrum Rights and 3G licenses. By maintaining, the end-2004 nationwide 3G network roll-out requirement, the IDA may “force” the incumbent mobile operators to incur substantial investments in 3G network infrastructure before the 3G technology is mature and stable, before 3G terminals are sufficiently developed and available, and before the Singapore market is ready. In effect, maintaining the end-2004 nationwide 3G network roll-out requirement may result in the incumbent mobile operators being required to make inefficient 3G network infrastructure investments which may adversely effect the telecommunications industry and the development of 3G in the long run. We would recommend that the IDA remove the regulatory requirement for the incumbent mobile operators to deploy a nationwide 3G network by end-2004.
- 3.17 In the event that the IDA is not inclined to completely remove the regulatory requirement, we would recommend that the IDA remove the “nationwide” coverage requirement. With its removal, the incumbent mobile operators will still have an obligation to deploy 3G network infrastructure and services by end – 2004, however, they need not deploy nationwide.
- 3.18 Whilst we believe that it may be reasonable to envisage demand for 3G services in specific areas such as the CBD, we do not believe that demand outside of the CBD areas would otherwise warrant investment in 3G network infrastructure. Removing the nationwide coverage requirement will provide the incumbent mobile operators with the necessary flexibility to make more economically efficient decisions when investing and deploying 3G network infrastructure. Further, incumbent mobile operators will be better able to focus their efforts and resources with respect to 3G network deployment and service provisioning. We believe that providing this flexibility to the incumbent mobile operators will ultimately provide long term benefits to the telecommunications industry and end users.

(ii) Access to In-Building Facilities

- 3.19 As the IDA is aware, in-building deployment is currently achieved through commercial agreements between the incumbent mobile operators and the building owner/building developer. As such, the speed of deployment is often hindered by building owners/building developers delaying the negotiations or requesting exorbitant rents. In some cases, in-building deployment plans are abandoned due to difficulties faced by the mobile operators in obtaining access on reasonable terms and conditions.

- 3.20 We would recommend that the IDA strengthen the framework applicable to in-building facilities to enable the mobile operators to obtain efficient access on reasonable terms and conditions.
- 3.21 In summary, the primary objective of infrastructure sharing is to reduce the costs associated with deploying 3G network infrastructure. The incumbent mobile operators have existing mobile infrastructure which they can leverage on in order to deploy their 3G network infrastructure. As such, we are of the view that it is unlikely that more comprehensive 3G infrastructure sharing between the incumbent mobile operators would deliver significant benefits.
- 3.22 We believe that the current infrastructure sharing approach is appropriate and sufficient. However, we would recommend that the IDA remove the requirement to deploy a nationwide 3G network by end-2004. In the alternative, should the IDA retain a network roll-out requirement, we would recommend that the IDA remove the requirement that the 3G network be “nationwide”. This would provide the necessary flexibility for the incumbent mobile operators to make economically rationale and efficient investment decisions with respect to their 3G network infrastructure and service deployment. In our view, this would better serve the long term interests of the telecommunications industry and the interests of end users in Singapore.
- 3.23 Finally, we recommend that the IDA strengthen the framework applicable to in-building facilities to enable the mobile operators to obtain efficient access on reasonable terms and conditions.

***(c) What are the potential and benefits arising from 3G infrastructure sharing that would accrue to our telecommunication industry as a whole and to consumers?***

- 3.24 In order to make an objective assessment of 3G infrastructure sharing, it is necessary to weigh both the benefits and the costs. The more comprehensive the infrastructure sharing, the more complex the issues become in terms of the commercial, technical, operational aspects. In addition, a more comprehensive infrastructure sharing approach may give rise to competition related issues. As we have indicated above, we recommend maintaining the current approach of infrastructure sharing.
- 3.25 There are essentially four (4) main approaches to sharing of the 3G network infrastructure:
- (a) Site Sharing;
  - (b) Radio Network Sharing;
  - (c) Geographical Network Sharing;
  - (d) Total Network Sharing.



**(a) Site Sharing**

Site sharing primarily involves the radio base station (BTS) site facilities. The incumbent mobile operators currently engage in site sharing. Site sharing can be further broken-down into the following sub-groups:

- (i) Outdoor site infrastructure;
- (ii) In-building site infrastructure;
- (iii) Site Rental.

(i) Outdoor Site Infrastructure

Outdoor sites include towers and monopoles. Incumbent mobile operators have already undertaken this type of sharing and negotiated and agreed sharing arrangements for some outdoor sites. By way of example, the tower on the island of Pulau Tekong is a shared outdoor site. In general, the sharing is based on one to one exchange for antennae space for the erected towers from existing operators.

We recommend maintaining the current approach of infrastructure sharing between the incumbent mobile operators.

(ii) In-Building Site Infrastructure

In-building site infrastructure involves the installation of a distributed antenna system in a building. Incumbent mobile operators have already undertaken this type of sharing. In our view, more comprehensive sharing of in-building site infrastructure will not deliver significant cost savings.

We believe that the number of sites that could potentially be shared is low as most of the existing sites are already congested. Further, we are of the view that mobile operators would prefer to co-locate their 3G and 2G equipment together.

Further, it has been our experience that joint deployment of a site involves a greater amount of logistics and the deployment schedule is much longer. Some of the issues which would arise include:

- Coverage areas;
- O&M;
- Optimisation of system parameters;
- Asset ownership;
- Agreement to the tender process;
- Agreement on the cost allocation principles;
- Agreement on which mobile operator's existing mobile infrastructure should be retrofitted to support 3G for other mobile operators.

In addition, in-building coverage is a major service differentiator in the Singapore market. More comprehensive 3G infrastructure sharing of this type may result in reduced competition in this aspect. Further, it may reduce flexibility and innovation. For example, the introduction of new services and products could be inhibited where one mobile operator sub-lets or reuses the infrastructure to introduce other wireless services (e.g. a trunk radio service).

In summary, this type of infrastructure sharing gives rise to a number of commercial, technical, operational and competition related issues. The potential savings may not be significant as most of the investment has already been made by the incumbent mobile operators to meet the coverage requirement for their existing mobile networks.

We recommend maintaining the current approach of infrastructure sharing between the incumbent mobile operators.

(iii) Site Rental

Site rental is the cost required to locate base stations, antenna systems and other related equipment in buildings and rooftops of buildings. In our view, more comprehensive sharing of site rental will not deliver significant cost savings.

Under this type of sharing, each mobile operator would deploy its own equipment, and as such the total space requirement remains the same. Each mobile operator will still have to run its feeder cable and install its antennae. In addition, such sharing arrangements may require clearance, and therefore further delay, from other government agencies such as the CESMA (i.e. Civil Electrical Mechanical Structural and Architectural) which approves the rental of the HDB sites. Further, the incumbent mobile operators have already invested heavily in in-building solutions for their existing mobile networks and as such, this is not likely to deliver significant cost savings.

However, we have recommended in (b) (ii) above, that the IDA strengthen the framework applicable to in-building facilities to enable the mobile operators in obtain efficient access on reasonable terms and conditions

We recommend maintaining the current approach of infrastructure sharing between the incumbent mobile operators.

**(b) Radio Access Network (RAN) Sharing**

There are many variations to this approach. The cleanest way to maintain the operator identity is to have the RAN to support multiple network code (multi-PLMN) by implementing a mixture of logical and physical partitioning of the 3G network.

However, the common UTRAN would have to be configured with more RF carriers, to support multiple network identity (PLMN code). This would require an increase in the common UTRAN capex.

This degree of sharing is complex and gives rise to a number of commercial, technical and operational issues including:

- Capacity/expansion requirement;
- O&M;
- Optimisation;
- Billing;
- 2G/3G handover;
- Commercial charging principles;
- Purchase of new network features – not all operators may want to implement the same feature;

More comprehensive 3G infrastructure sharing of this type will mean that there is no coverage differentiation. Further, there would be no 3G network redundancy at the national level.

We do not recommend this type of 3G infrastructure sharing approach.

**(c) Geographical Network Sharing**

This type of infrastructure sharing is more appropriate and relevant where coverage is required over a large geographic area. We do not believe that it is relevant or appropriate in the highly urbanised city-state of Singapore

We do not recommend this type of 3G infrastructure sharing approach.

**(d) Total Network Sharing**

This is similar to the MVNO scenario. There are considerable commercial, technical and operational issues associated with a total network sharing approach.

We do not recommend this type of 3G infrastructure sharing approach.

***(d) Would infrastructure sharing actually lead to faster and better 3G services? How would infrastructure sharing lead to faster and better services?***

- 3.26 More comprehensive 3G infrastructure sharing may not actually result in “faster” or “better” 3G services. As our response in 3.25 above serves to illustrate, infrastructure sharing may take a number of forms. The more comprehensive the infrastructure sharing, the more complex infrastructure sharing becomes.
- 3.27 In terms of “faster” deployment of 3G services, the 3G licensees are incumbent mobile operators. Each has already deployed a nationwide mobile network and will be able to leverage on their existing network infrastructure to facilitate their 3G network roll-out. As we have indicated above, more comprehensive infrastructure sharing involving in-building facilities, RAN or total network sharing would give rise to significant commercial, technical and operational issues. In addition, it would give rise to competition related issues. Identifying and resolving all these issues would take time. Given the complexity of the commercial, technical and operational issues involved, commercial agreement is likely to be difficult. In light of this, a more comprehensive 3G infrastructure sharing approach may not result in “faster” deployment of 3G services.
- 3.28 In terms of “better” 3G services, as we have indicated above, a more comprehensive infrastructure sharing approach involving in-building facilities, RAN or total network sharing would give rise to significant technical and operational issues. The more comprehensive the infrastructure sharing, the more issues arise with respect to service and product differentiation and service quality. With total network sharing, there may be little or no differentiation save in terms of the “soft” aspects such as marketing, billing, customer service etc. As a result, more comprehensive 3G infrastructure sharing may not produce “better” 3G services.
- 3.29 In summary, a more comprehensive 3G infrastructure sharing approach would give rise to significant commercial, technical and operational issues. Further, it would also give rise to competition related issues. In light of this, a more comprehensive 3G infrastructure sharing approach may not result in “faster” or “better” 3G services.
- 3.30 We believe that the current infrastructure sharing approach is sufficient and appropriate.

- (e) ***What would be the appropriate type, nature and extent, and timing and duration, of infrastructure sharing? Please provide your reasons and rationale for this.***
- 3.31 As we have indicated above, we believe that the current infrastructure sharing approach is sufficient and appropriate.
- 3.32 More comprehensive 3G infrastructure sharing involving in-building facilities, RAN or total network sharing would give rise to significant commercial, technical and operational issues. Furthermore, it would also give rise to competition related issues.
- 3.33 Given the short term nature of the infrastructure sharing envisaged by the IDA, even if one assumes that there is a net benefit to industry or end users (which is unclear and uncertain), the net benefit would similarly be short term in nature.
- 3.34 In light of the above, we recommend that the IDA maintain the existing approach to infrastructure sharing. We do not believe that more comprehensive 3G infrastructure sharing would necessarily address the issues confronted by the mobile operators nor would it result in “faster” or “better” 3G services. Furthermore, there are significant commercial, technical, operational issues which would arise with more comprehensive 3G infrastructure sharing.
- (f) ***Would any potential competition concerns arise with infrastructure sharing? If so, how would such competition concerns be addressed to ensure that there is no adverse impact on 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?***
- 3.35 Effective competition in the mobile telecommunications industry in Singapore has been established through the principle of infrastructure competition. End users in Singapore have been able to realise the benefits that vigorous infrastructure competition can deliver. As we have indicated above, where infrastructure sharing occurs in a manner similar to the existing approach to infrastructure sharing, there are little or no competition concerns. However, where there is more comprehensive infrastructure sharing, competition issues arise as infrastructure competition reduces.
- 3.36 Typically, mobile operators compete across a range of aspects including (without limitation):
- (i) Services;
  - (ii) Quality of Service; and
  - (iii) Coverage.

3.37 Under the current infrastructure sharing approach, there are little or no competition concerns. Incumbent mobile operators continue to vigorously compete on all aspects. However, as infrastructure-based competition is reduced and the degree of infrastructure sharing increases, the incentive and the ability to compete on all aspects diminishes. By way of example:

- Currently, in-building coverage is a major service differentiator in the Singapore market. If mobile operators were to share in-building facilities, the mobile operators would be less competitive in terms of in-building coverage. Infrastructure sharing of this type may reduce competition on this aspect.
- If mobile operators were to share the radio network, not only would coverage be the same, but there may be little or no differentiation in the quality of service. Infrastructure sharing of this type may reduce competition on coverage and quality.
- If mobile operators were to engage in total network sharing, not only would coverage and quality be the same, the features and functionality would be the same. There may be reduced incentive to engage in new service development or innovation as it may involve some co-operation between the mobile operators (where network enhancements are required) or where the same features and functionality is available to the other mobile operator.

3.37 Other potential competition issues may arise from the close co-operation between the mobile operators which would be necessary under a more comprehensive 3G infrastructure sharing approach.

3.39 In our view, regulation could not address the overall effects on competition arising from reduced infrastructure based competition. If the IDA attempted to do so, there is considerable risk that such intervention would distort the development of the market. Regulation is a poor substitute for the operation of market forces.

**(g) What are the monitoring and enforcement issues that may arise on the extent of infrastructure sharing to be established and their scale-back?**

- 3.40 As we have indicated above, we believe that the current infrastructure sharing approach is sufficient and appropriate.
- 3.41 Where infrastructure sharing occurs in a manner similar to the existing approach to infrastructure sharing, there is little or no need for regulatory monitoring or enforcement. Where certain infrastructure is designated Critical Support Infrastructure (“CSI”) under Section 6 of the Code of Practice for Competition in the Provision of Telecommunications Services (“Code”), the role and responsibilities of the IDA is specified. The mobile operators may commercially agree to site share where it is desirable to do so or in circumstances where the building owner and/or building developer prefers a site sharing approach for in-building coverage.
- 3.42 In the event that there is more comprehensive 3G infrastructure sharing approach, our view is that regulatory intervention and the role of the IDA should be kept at a minimum. The commercial, technical and operational aspects of infrastructure sharing should be left to the mobile operators to commercially negotiate and agree. The IDA should not intervene in such a manner as to determine the commercial, technical and operational issues associated with infrastructure sharing. In our view, the risk that such intervention will distort the development of competition in the market is too great.
- 3.43 The role of the IDA should be limited to monitoring/enforcing the requirement for the mobile operators to deploy their own 3G network infrastructure in accordance with a detailed 3G network roll-out plan submitted and approved by the IDA.

**(h) What would be appropriate monitoring criteria to ensure that infrastructure sharing takes place in accordance to an approved framework?**

- 3.44 As we have indicated above, we believe that the current infrastructure sharing approach is sufficient and appropriate.
- 3.45 In the event that a more comprehensive 3G infrastructure sharing approach is adopted, the role of the IDA should be kept at a minimum. Mobile operators should be left to commercially negotiate and agree the commercial, technical and operational issues associated with infrastructure sharing.
- 3.46 In terms of monitoring criteria, the mobile operators should submit a detailed 3G network roll-out plan. The IDA should be restricted to monitoring the mobile operators compliance with detailed 3G roll-out plans.

(i) *How should scale-down of the infrastructure sharing be monitored?*

- 3.47 As we have indicated above, we believe that the current infrastructure sharing approach is sufficient and appropriate.
- 3.48 In the event that a more comprehensive 3G infrastructure sharing approach is adopted, scale-down of infrastructure sharing should be monitored via the monitoring of compliance with the detailed 3G network roll-out plan submitted and approved by the IDA.