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June 30, 2003

Mr. Andrew Haire  
Senior Director (Policy & Regulation)  
Infocomm Development Authority of Singapore  
8 Temasek Boulevard  
#14-00 Suntec Tower Three  
Singapore 038988

Re: **Designation of Singapore Telecommunications Ltd's Local Leased Circuits as Mandatory Wholesale Service**

Dear Mr. Haire:

On behalf of AT&T Worldwide Telecommunications Services Singapore Pte. Ltd. ("AT&T"), I am pleased to submit the following comments on the IDA's Consultation Paper concerning *Designation of Singapore Telecommunications Limited's Local Leased Circuits as Mandatory Wholesale Service*, issued on 30 May 2003 (the "*Consultation Paper*"). The *Consultation Paper* reflects another important milestone in the IDA's efforts to achieve sustainable and effective telecommunications competition, to the benefit of consumers and businesses in Singapore.

AT&T supports IDA's proposal to mandate inclusion of Local Leased Circuits ("LLCs") in the SingTel Reference Interconnect Offer ("RIO"), and below, offers recommendation on how to implement this proposal. Specifically, AT&T confirms that SingTel's current LLC practices are impeding effective competition, asserts that IDA has a legal obligation to mandate inclusion of LLCs in the SingTel RIO, identifies the critical elements of LLC infrastructure and service that SingTel must include in a RIO, recommends a sustainable pricing methodology for the RIO services, and recommends a process for reviewing and updating the LLC section of the RIO.

## **I. Background – The Current State of Competition for LLCs**

The IDA correctly recognizes that effective competition in the provision of LLCs to businesses can make a positive contribution to the competitiveness of the overall Singapore economy. *Consultation Paper* at ¶2.4. Local leased circuits are an essential building block for

providing telecommunications service to end-users, as they connect a competitive carrier's point of presence to a customer premise. SingTel, the incumbent carrier, has a network of local exchanges and LLCs that extends to every significant business site in Singapore. It will take years for other facilities-based operators ("FBOs") to replicate components of the SingTel network, and in a competitive environment that does not provide government funded subsidies or rate of return assurances, facilities-based competition to some locations might not ever be economically viable due to SingTel's absolute sunk cost advantage and installed customer base.

Singapore's LLC market is not competitive. To AT&T's knowledge, there has been no material reduction in retail LLC charges since market liberalization in 2000, and SingTel remains the only facilities-based provider to most end-user locations. At present, SingTel has not developed wholesale pricing for most of its LLC products, including the very important DigiPlus and DigiLink services. *Consultation Paper* at ¶2.4. SingTel's LLC rates to competitive carriers are equivalent to and sometimes higher than the retail LLC rates that SingTel charges to its end-user customers. New entrants are not able to compete with SingTel on the basis of price for LLCs.

When providing an international service from Singapore, an LLC currently can comprise 70% of the underlying network costs, and this percentage sharply increases if a customer has multiple sites within Singapore.<sup>1</sup> Under the current structure, competitive carriers are unable to effectively compete with SingTel on contracts that are heavily dependent on Singapore LLCs. This harms competitive carriers, but more important to the IDA, it harms the competitiveness of Singapore as a hub for telecom-intensive industries. Without the benefits of increased innovation, improved customer service and reduced price that accompany full competition, such customers have incentives to look to other jurisdictions when determining where to locate their most telecom-intensive activities. These customers are vital to the overall Singapore economy, including industries as diverse as shipping, transportation, finance, manufacturing, bio-research, pharmaceuticals, and software design. A RIO for LLCs will improve competition among telecommunications carriers, which in turn will make Singapore a more competitive info-communications economy.

The IDA should adopt additional regulatory measures to facilitate competition in the Singapore LLC market. Current market forces in the LLC market are not effective and are not promoting the consumer welfare. Prices remain high three years after market liberalization. Barriers to entry will remain high given the substantial sunk costs and substantial cost advantages enjoyed by the incumbent in comparison to new entrants. There are very few competitive substitutes for LLCs, and these are only to a limited number of end-points.

As IDA has done before with great effect,<sup>2</sup> it should now facilitate access to bottleneck infrastructure controlled by SingTel by requiring a RIO amendment. Doing so would be consistent with the Code of Practice, which sets forth the obligations for interconnection with dominant licensees.<sup>3</sup> Also of tremendous importance, an LLC RIO would be consistent with

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<sup>1</sup> See *Regulation of Local Access Leased Lines: A Critical Issue for Singapore's Economic Development*, submitted to IDA on 18 Oct 2002, at p. 7 (showing 67% spend for LLC, 21% spend for international cable, 12% spend for backhaul and cross-connect).

<sup>2</sup> For example, by amending SingTel's RIO to include connection services at submarine cable landing stations.

<sup>3</sup> *Code of Practice for Competition in the Provision of Telecommunications Services*, S 412/2000 at ¶5 (Sept. 15, 2000) ("Code of Practice").

Singapore's specific commitments under the recently signed US-Singapore Free Trade Agreement, which starting in 2004 will obligate Singapore to ensure that major suppliers make available "leased circuit services," "on terms and conditions under pricing structures, and at rates that are reasonable, non-discriminatory (including with respect to timeliness), and transparent."<sup>4</sup> Inclusion of LLC services in SingTel's RIO would send a powerful message affirming Singapore's unwavering commitment to this new and important Free Trade Agreement.

## II. Scope of Mandatory LLC RIO

The LLC RIO must be sufficiently detailed to ensure that competitive carriers are able to obtain all essential LLC network elements and associated services pursuant to terms and conditions no less favorable than SingTel accords to itself, its subsidiaries or its affiliates. Prior experience suggests that failure to include all critical components of an LLC service within the RIO will result in an impaired policy. AT&T therefore recommends that IDA require SingTel to include the following unbundled elements within an LLC RIO: (1) Tail circuit service; (2) Trunk circuit service (i.e., grooming circuit); (3) Multiplexing service (i.e., grooming); (4) Co-location service; and (5) Cross-connect service (i.e., as substitute for grooming circuit if carrier node is co-located in SingTel exchange premises). SingTel should be required to offer each of these service a la carte and without restrictions on further resale to other carriers, such that competitive carriers have flexibility to buy any LLC network element from SingTel, to buy any element from other competitive carriers, or to build and operate any element itself.

The tail circuit service is the dedicated link between the customer premises and the point of interconnection with multiplexing equipment at a SingTel exchange.<sup>5</sup> Due to the geographic coverage requirements to reach all customer premises, competitive carriers will have a frequent and potentially long-standing need to utilize the SingTel tail circuit service. The service should cover all SingTel LLC end-points, and up to such bandwidths until the incumbent would not have an absolute unit cost advantage in deployment of infrastructure. A reasonable estimate of the point at which it might become economically viable to deploy a new fiber spur from a metro fiber ring to a particular building site is at 3 x DS3 (45Mbps) loading, or cumulative 135 Mbps.<sup>6</sup> Likewise, AT&T is experiencing an increasing number of inquiries from some of our most telecom-intensive users -- those most important for stimulating the Singapore info-communications economy -- of tail circuit requirements up to 45 Mbps. Accordingly, to

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<sup>4</sup> *United States – Singapore Free Trade Agreement*, Chapter 9: Telecommunications, at Article 9.4.9(a) (Provisioning and Pricing of Leased Circuits Services) (signed May 6, 2003); *See also*, Fourth Protocol to World Trade Organization General Agreement on Trade in Services, April 15, 1997, *Singapore Schedule of Specific Commitments, Annex: Reference Paper*, ¶¶ 2.2, 2.2(a), 2.2(b), GATS/SC/76/Suppl.2 (obligating non-discriminatory and cost-oriented access to major supplier network).

<sup>5</sup> As described below, IDA should ensure that the multiplexing service is an unbundled element in the LLC RIO, such that a new entrant could either purchase multiplexing from SingTel, or co-locate its own multiplexing equipment at the exchange.

<sup>6</sup> AT&T bases its estimate of economic viability on our US experience, which takes account the following factors: (1) efficient LRIC charges of incumbent ("x"); (2) efficient cost for new entrant to build facility ("y"); and (3) deriving minimum loading of facility and associated revenue stream necessary to ensure that new entrant can recover "y" if charging no more than "x" per unit sold. For present purposes, AT&T is estimating a similarity of factors "x" and "y" between Singapore and major US cities.

encourage competitive market entry up to a point where barriers to entry remain pervasive through a “build or buy” option, and to preserve facility investment incentives up to and beyond that point, the tail circuit service RIO should cover bandwidth speeds between 9.6 Kbps up to 45 Mbps.<sup>7</sup>

A trunk circuit service, also called a grooming circuit, is the dedicated link between the multiplexing equipment at a SingTel exchange and a competitive carrier’s node located at a separate site from that SingTel exchange.<sup>8</sup> Although competitive carriers will increasingly have an economically viable business model to build alternative trunk circuits between a SingTel exchange and other “carrier hotel” sites owned either by SingTel or other parties, for the foreseeable future competitive carriers will need to utilize the SingTel trunk circuit service. Over time, provided that SingTel does not restrict the ability of competitive carriers to interconnect trunk circuits into their own multiplexing equipment co-located at SingTel exchanges – and to use such circuits to carry traffic of other carriers – competitive alternatives to SingTel trunk circuits will emerge. A reasonable estimate of the point at which it becomes economically viable to construct a metro fiber ring supporting trunk circuits that connect various SingTel exchanges and competitive carrier node sites is at 14 x DS3 (45Mbps), or cumulative 630 Mbps.<sup>9</sup> To ensure efficient grooming/multiplexing of the high capacity tail circuits now in demand, and to preserve facility investment incentives up to and beyond that point, the SingTel RIO trunk service should be made available at bandwidth speeds between 64Kbps up to 622 Mbps (STM-4).<sup>10</sup>

A third critical component of a SingTel LLC RIO is a multiplexing service. To the extent that a competitive carrier orders a tail circuit service and a trunk circuit service from SingTel, it is appropriate for SingTel to include a multiplexing charge to cover the network and staff costs for grooming the individual tail circuits onto the trunk circuit. Likewise, under a modular LLC RIO, if a competitive carrier orders a tail circuit service from SingTel, but co-locates its own MUX equipment at a SingTel exchange and either self-provisions a trunk circuit or leases the trunk circuit from a third party competitive carrier, then SingTel should not have built-in an implicit multiplexing charge to the tail circuit price. To ensure transparency, flexibility, reasonable cost-oriented rates, and non-discriminatory provisioning times, IDA should require SingTel to include an unbundled multiplexing service in its LLC RIO.

Co-location and physical access are important components of a modular LLC RIO, particularly as competitive network investment increases. Although AT&T is confident that co-location and physical access at SingTel local exchanges already are covered under Schedule 8A (Co-location for Point of Interconnection) and Schedule 8B (Co-location for Point of Access) of the SingTel RIO, to eliminate any doubt whether these existing Schedules ensure not only access to provide switched voice services but also dedicated LLC services, IDA should mandate amendments to the existing Schedules to ensure co-location of equipment for the provision of

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<sup>7</sup> Specifically: 9.6K, 19.2K, 64K, 128K, 192K, 256K, 384K, 512K, 576K, 640K, 704K, 768K, 832K, 896K, 960K, 1024K, 1088K, 1152K, 1216K, 1280K, 1344K, 1408K, 1472K, 1536K, 1600K, 1664K, 1728K, 1792K, 1856K, 1820K, 1984K, 2M, 8M, 34M, 45M.

<sup>8</sup> As described below, if a competitive carrier co-locates its node at the SingTel exchange rather than at a separate building, it should be permitted to purchase a less expensive cross-connect service rather than a trunk circuit service.

<sup>9</sup> See note 6, *supra*, for an explanation of methodology supporting this estimate.

<sup>10</sup> Specifically: 64K, 1984K, 2M, 8M, 34M, 45M, 140M, 155M (STM-1), 622M (STM-4).

LLC service. For the terms of co-location to be no less favorable to competitive carriers than such terms are to SingTel, there must be no restrictions on use of such co-located equipment to interconnect either with SingTel or with other co-located competitive carriers (e.g., for competing trunk circuit service), to provide wholesale service to third party competitive carriers, or to provide retail service to end-users.

Finally, the SingTel LLC RIO must provide a cross-connection service that would be utilized if a carrier co-locates at a SingTel exchange. A cross-connection service is the link between the SingTel circuit termination equipment at the exchange and the competitive carrier's node equipment at the same SingTel exchange. When a competitive carrier co-locates its node equipment in a SingTel exchange, it would not be cost-justified to levy a trunk circuit charge premised on service between separate buildings, due to the lower cost structure for installing internal cabling. To reflect the lower cost structure, SingTel should offer an LLC cross-connect service that is designed to connect groomed traffic between the circuit termination equipment in SingTel's local exchange and the competitive carrier's node in the same exchange.

For all of the above elements of the LLC, the RIO must ensure that competitive carriers are treated no less favorably than SingTel treats itself, its subsidiaries and its affiliates. As discussed in the following Section, the prices should reflect only the costs of the underlying network elements and associated services (e.g., equipment, line conditioning, testing and human resources), plus a reasonable rate of return. The services should be offered with enforceable service level agreements, with meaningful financial penalties that cover all relevant aspects of the service provided, such as ordering, delivery, availability, and repair time. The provisioning times for each service should be as short as possible, benchmarked against best practice for wholesale service, and in all cases no less favorable than when SingTel provisions retail customers. As a final matter, to help validate SingTel's compliance with the non-discrimination requirement, SingTel should publish a reference report in a transparent manner, containing its internal transfer charges for each LLC service, its internal terms and conditions of service, and its internal quality of service metrics. This reference report will be a valuable tool for evaluating sufficiency of the RIO.

### **III. RIO Pricing Methodology**

Although AT&T commends the IDA for proposing a material reduction in the SingTel LLC rates, AT&T has concerns with IDA's proposed "retail-minus" pricing methodology. *Consultation Paper* at ¶3.1(a). The proposed discount of approximately 40% off SingTel's published retail LLC prices appears to offer a very significant short-term cost improvement; however, this approach would not ensure the cost-orientation of the LLC rate and may not ensure that these rates are non-discriminatory. As an alternative, AT&T encourages the IDA to undertake a two-phase approach to establishing RIO pricing: (1) for year 1, determine LLC rates in Singapore by benchmarking against the rates of similar LLC services in comparable markets in other countries; (2) during year 1, conduct a thorough bottom-up cost study based on Forward Looking Economic Cost ("FLEC") using Long Run Average Incremental Cost ("LRAIC") modeling principles, and beginning in year 2 establish cost-oriented rates based on the results of the bottom-up study.

A “retail-minus” methodology brings risks that could undermine the pro-competitive intentions of the LLC RIO. First, there is substantial ambiguity concerning what are SingTel’s current retail rates for LLC services. As an example, whereas SingTel explicitly charges competitive carriers for both a tail circuit and a grooming circuit for access to each customer location, it appears that in many retail arrangements with end-user customers SingTel only charges for a tail circuit (and it is not clear to AT&T in what manner SingTel recovers the trunk circuit and multiplexing costs). If this is a persistent practice, then the wholesale “retail-minus 40%” charge including trunk circuit, multiplexing and tail circuit could still exceed a retail end-user bid by SingTel that only shows a tail circuit charge. Second, AT&T believes that although a 40% discount off of current retail rates would offer a significant cost reduction, it might not meaningfully improve competition. The “retail-minus” amount may still be significantly above cost, providing SingTel with an ongoing ability to under-price the competition through its internal transfer charges, and allowing SingTel to continue collecting inefficient profits to the detriment of business end-users. Finally, reflecting both concerns above, “retail-minus” could provide diminishing competitive incentives over time. Even if IDA confirms the standard retail services and sets a “retail-minus” wholesale rate, if SingTel then lowers the end-user retail rate in response to competition (as would be the goal of the policy), then the current wholesale discount would be less than 40% off retail. IDA would need a mechanism to automatically adjust-down the wholesale rates in lock step with subsequent SingTel reductions in retail rates.

As an alternative, AT&T advocates a manageable two-phase approach that provides the short-term benefit of expedient improvements, and the long-term benefit of a principled cost-oriented methodology that ensures efficient recovery of costs plus a reasonable rate of return. For phase one, the IDA could quickly establish RIO rates on the basis of a benchmarking study comparing rates for similar services in comparable jurisdictions. This approach is relatively quick to implement and has been used effectively by other regulators. In fact, the US-Singapore FTA explicitly permits this benchmarking approach, stating that Singapore “may determine whether rates for leased circuits services . . . are reasonable by taking into account the rates of like leased circuits services in comparable markets in other countries.”<sup>11</sup> Towards this goal, several of the competitive carriers in Singapore, including AT&T, have hired an independent consultant to prepare a wholesale LLC benchmarking study that will be submitted to the IDA in the near future. For IDA’s consideration, this independent study will indicate the range of appropriate wholesale rates for use during phase one.

In phase two, with a price based on benchmarks already in effect from the first phase, the IDA should take one year to conduct a thorough bottom-up LRAIC cost study to determine with precision the efficient forward looking costs of SingTel in providing the LLC services. The flaw with “retail-minus” or even a “top-down” model is that it will contain a tremendous amount of deeply embedded inefficient charges that are based on SingTel’s legacy practices from before market liberalization. If a goal of IDA is to enhance Singapore’s position as an info-communications and business hub by ensuring lower business costs for telecom services, a bottom-up study will best achieve this goal. It will achieve cost-orientation based on the

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<sup>11</sup> *US-Singapore FTA* at Article 9.4.9(b).

forward-looking pricing principles adopted in Singapore's Code of Practice on Competition.<sup>12</sup> Further, because IDA will have a detailed model of both SingTel's costs and its internal transfer charges, wholesale prices based on a bottom-up study will help ensure non-discrimination. SingTel should get a reasonable return on its investment, competitive carriers should get an unimpaired opportunity to compete, and telecom-intensive business customers in Singapore should receive the benefits of a fully competitive industry.

During both phases of AT&T's proposed RIO pricing methodology, in addition to establishing the standard RIO wholesale rates for each LLC service, it might be appropriate to permit SingTel to offer a discount from its cost-oriented rates based on quantity purchased. This volume-based discount would properly reflect both the account management efficiencies that inure to larger accounts, and also reflect that as competition for LLCs does take hold, SingTel should be able to offer volume-based incentives to attract or retain wholesale customers. One essential caveat to the discount scheme is that it must not be structured such that only SingTel and its affiliates are entitled to the highest level of discount.

#### **IV. RIO Term Timeframe**

The IDA has proposed a 2-3 year timeframe for the term of an LLC RIO, during which FBOs should build or develop the necessary infrastructure to compete in the local LLC market for the longer term. *Consultation Paper* at ¶3.1(a). Although AT&T would encourage a biennial or triennial review of the ongoing effectiveness of existing RIO terms (such as the review currently underway of existing RIO Schedules), it is imperative that the initial LLC RIO must not be scheduled to sunset at the conclusion of the 2-3 year timeframe. Rather, the presumption should be that the LLC RIO would remain in effect unless and until IDA determines in a subsequent review that sufficient competitive alternatives have taken firm root, thus meriting relaxed regulation.

Establishing a rate regulation sunset would be counterproductive. If relief from regulation were fixed in SingTel's sight within 2-3 years, SingTel would have strong incentives to delay implementation of its RIO obligations at every opportunity until relieved of obligations. By contrast, if relief from regulation can only be earned pursuant to an IDA review that evaluates SingTel compliance and the competitive market response, SingTel will have greater incentives to facilitate competition by implementing the RIO.

Moreover, for some tail circuit destinations at smaller sites, it is likely SingTel will always hold an absolute cost advantage over new entrants. To reach business centers with low or moderate volume, it is difficult to determine when it would be economically viable to construct competing facilities given SingTel's substantial economies of scale and previously sunk costs. Even to reach major business centers, the process of developing a competing facilities-based network is incremental, responding to increasing demand over time, but in the interim building a robust customer base through the use of leased facilities. Under current market conditions with restricted new telecom spend by end-users, and the associated capital investment constraints on new entrants, it is rational to expect facility investment to be slower than average. It is not reasonable or realistic to anticipate that new entrants would build over a

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<sup>12</sup> *Code of Practice, Appendix One: Principles Governing the Pricing of Interconnection Related Services* at ¶2.2.1 (dominant license must use long run average incremental cost for the computation of most IRS prices contained in its RIO).

matter of months in a competitive environment, what SingTel built over decades in a monopoly environment. Given this inherently long-term process for developing alternative facilities, rewarding premature regulatory relief to SingTel could actually dampen alternative investment if competitors fear they will not be able to interconnect with SingTel on reasonable terms after that time.

For the benefit of Singapore and its end-users, a robust LLC RIO will give competing carriers the opportunity to incrementally build a customer base, and to then construct alternative facilities when it is economically rational and efficient to do so. Accordingly, AT&T recommends that IDA conduct a triennial review of the LLC RIO, but that it treat the RIO as evergreen unless determined during a subsequent review to be no longer necessary for promoting competition.

## **V. Conclusion**

For the reasons set forth above, a RIO for LLC service will improve telecommunications competition, which in turn will make a positive contribution to the competitiveness of the overall Singapore economy. To be effective, the RIO must include several unbundled elements, including a tail circuit service, a trunk circuit service, a multiplexing service, a co-location service, and a cross-connect service. Pricing and provisioning of these services must be offered on terms no less favorable than SingTel provides to itself and its affiliates. For year one, pricing should be established by benchmarking against comparable services in comparable jurisdictions, and for year two onward pricing should be established by reference to a bottom-up LRIC model.

AT&T would be pleased to respond to any questions concerning these comments and to provide any further information that would be helpful to the IDA. Please do not hesitate to contact me in that regard.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "C. A. Barton", written in a cursive style.

C. A. Barton