

## **RESPONSE TO CONSULTATION PAPER 'PLANNING AND IMPLEMENTATION OF A NATIONAL BACKBONE NETWORK (NBN)'**

### **1. The information on the broadband availability in Sri Lanka (in the consultation paper) is not accurate.**

#### **1.1. Broadband (ADSL and WiMax) access is not limited to 'few main cities and towns' as claimed.**

Both Sri Lanka Telecom Ltd (SLT) and Dialog Broadband Network Pvt Ltd (DBN) the two main mass scale broadband services providers, confirm they offer services covering a much larger area than 'few main cities and towns'.

Latest SLT fiber infrastructure is not what presented in the map in the consultation paper. SLT states at the Investor forum February 2008, more than 50,000 ADSL connections have been provided in different places of the island including almost all key locations in the Western, Southern, Sabaragamuwa, Central and North Central provinces. Outside these areas, ADSL facilities are currently available at Anuradhapura, Badulla, Ampara and Vavunia. The next targets will be Trincomalee, Polonnaruwa, Batticaloa and Kalmunai.<sup>1</sup>

DBN offers broadband services in all provinces except North. With the expansion of the WiMax infrastructure in terms of capacity and reach, DBN claims covering approximately 30% of the country's landmass with 40% of population and also plans building a nationwide fiber network to cater to the growing need for backhaul transmission capacity. This will be done in two phases and the first one covering, in addition to Western province, Southern, Central, North Western and North Central Provinces by end 2008.<sup>2</sup>

At present DBN WiMax broadband services are available at locations like Akkareipattu, Kalmunai, Angunakolapelassa, Gandara, Sooriyawewa, Hingurakgoda, Medirigiriya, Mahakeliya, Narammala, Nikaweratiya etc that can hardly fit the description 'few main cities and towns'.<sup>3</sup>

#### **1.2. It is questionable whether it is the unavailability of island wide broadband or other factors that prevent government from offering e-government services.**

This sounds more like a poor excuse. The number of e-government services provided to citizens within better connected areas too is not high. On the other hand, perceived lack of broadband connectivity has not prevented some state organizations from delivering e-government services effectively. (eg. Release of examination results by Department of Education)

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<sup>1</sup> See [http://www.slt.lk/data/investor/investor\\_forum.htm](http://www.slt.lk/data/investor/investor_forum.htm) Accessed on 05/05/2008

<sup>2</sup> Dialog Telekom (2007) *Annual Report, Enriching Sri Lankan lives with Multi Sensory Connectivity*, Colombo, Sri Lanka

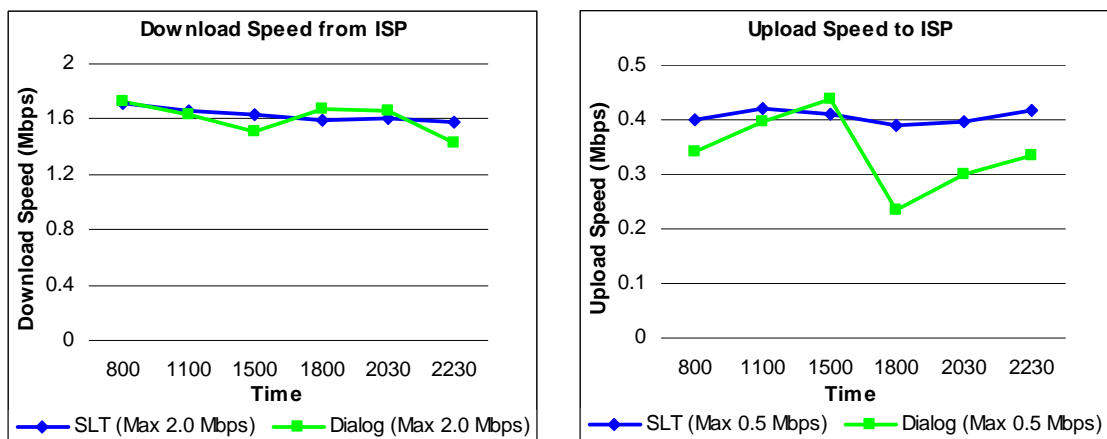
<sup>3</sup> Arunatilake, D. (2008) *Seminar on Broadband Quality of Service*, presented at 'Seminar Broadband Quality: Are you getting what is promised?' Colombo, Sri Lanka, 18 March, 2008. Accessed on April 28 <http://www.lirneasia.net/wp-content/uploads/2008/03/lirne-18mar-dialog08.ppt>.

**1.3. Actual broadband speeds experienced by the users might be lower than promised, but this cannot be attributed to the 'lack of national broadband infrastructure' per se. The culprits are elsewhere.**

LIRNEasia has conducted broadband QoS benchmarking for all widely used broadband packages in Sri Lanka and the outcome sheds some light to situation. Our research findings indicate;

- (a) Overall, both in download and upload the throughput is fairly healthy when accessing the ISP server. This indicates the bottlenecks if any will be not within the ISP domain and the last mile infrastructure performance is satisfactory.

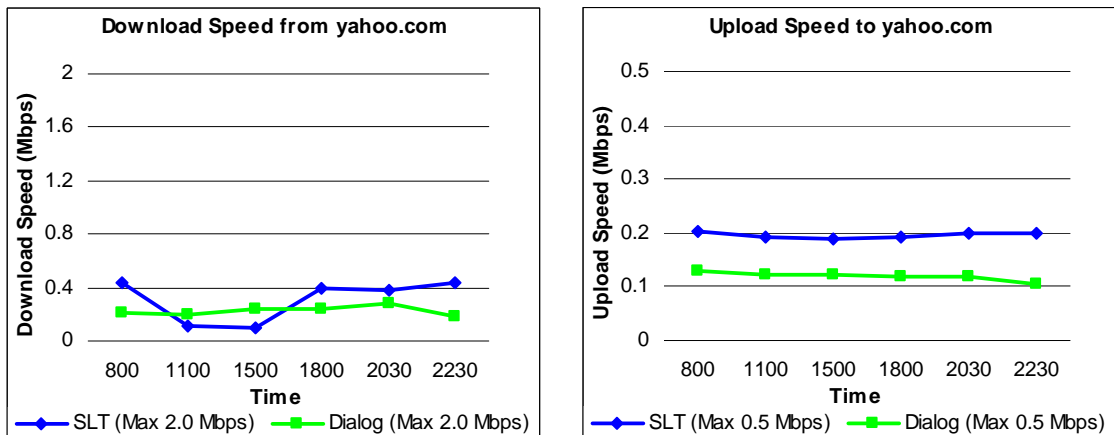
**Figures 1 & 2: Actual download and upload speeds of the business packages of two main broadband providers in Sri Lanka, tested during weekdays, accessing the Internet Service provider's server**



Source: LIRNEasia, *Broadband Quality of Service Indicators*, 2008

(b) On the other hand, when accessing international sites (the example used was yahoo.com) the speed considerably drops. This coupled with the other findings of the study like a considerable delay in reaching international servers indicates a serious dearth of international bandwidth.

**Figures 3 & 4: Actual download and upload speeds of the business packages of two main broadband providers in Sri Lanka, tested during weekdays, accessing an international server (www.yahoo.com)**



Source: LIRNEasia, *Broadband Quality of Service Indicators, 2008*

Any limitation in the international bandwidth availability cannot be addressed by implementing the suggested NBN. It requires purchasing more international bandwidth by operators, which is currently blocked by the near prohibitive costs.

## 2. There is no evidence to suggest the design of NBN took the prospective growth in broadband demand into account.

Exhibit 8 of NBN document shows existing and proposed geographical positions of the links (with questionable accuracy), but does not specify the individual link capacities. It appears that the design might have taken the geographical factors in to account, but not the prospective demand from each location. For example, what would be the demand for broadband from Moneragala and surrounding area for the next 10 years? How much of that would be taken care of by the operators? What would be the gap? Efforts to answer such questions are not seen in the design.

With the limited available information<sup>4</sup> and with reasonable assumptions<sup>5</sup> LIRNEasia could approximately predict the demand for broadband usage over the next 12 years.<sup>6</sup> Though these

<sup>4</sup> Telecommunication Regulatory Commission of Sri Lanka (2008). *Statistical Overview 1*, Available at: <http://www.trc.gov.lk/pdf/statover1.pdf> Accessed on 28/04/08

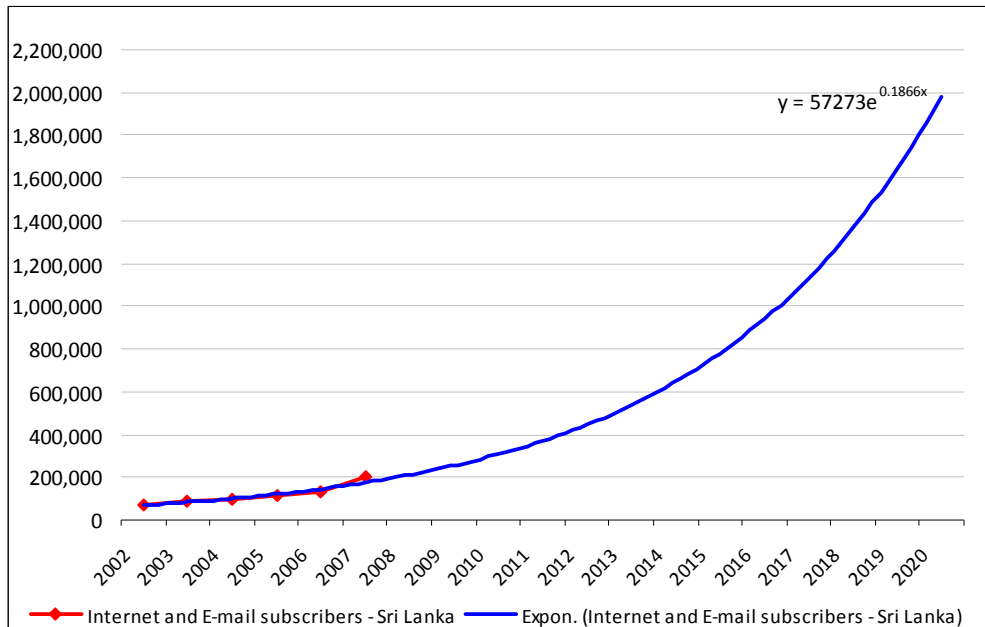
Department of Census and Statistics, Sri Lanka (2004) *Computer Literacy in Sri Lanka*, p. 7

<sup>5</sup> It was assumed that with the drop in prices all Internet and Email users in Sri Lanka will opt for broadband over narrowband and this will result in an exponential growth of Internet subscriber base for the next 12 years, not a liner growth as it has mostly shown during the last 10 years.

<sup>6</sup> A period of 12 years was considered assuming it would take two years for NBN to complete.

figures might differ from the actual with minor margins, efforts were taken to create the 'best case scenario so the actual demand will always be less than predicted.

**Figure 5: Projected Internet and E-Mail demand in Sri Lanka till 2020**



Source: LIRNEasia

The provincial level demand was estimated assuming the ratio of PC penetration among provinces (not the actual penetration) will remain same.<sup>7</sup> Table 1 shows the estimated provincial demand figures.

<sup>7</sup> PC penetration will increase in all provinces, but it is reasonable to assume they do at comparable ratios, except for unpredictable province specific development – both positive and negative. Findings of Computer Literacy survey 2004 by Department of Census and Statistics were used to calculate these ratios.

**Table 1: Projected Demand for Internet: 2011-2020 (Provincial)**

Province	2011	2014	2017	2020
Western	212,180	371,383	650,040	1,137,780
Central	43,550	76,227	133,421	233,530
Southern	27,239	47,677	83,450	146,065
Northern	6,193	10,840	18,973	33,209
Eastern	8,989	15,734	27,540	48,203
North Western	40,577	71,023	124,314	217,590
North Central	8,653	15,146	26,510	46,401
Uva	2,937	5,141	8,998	15,750
Sabaragamuwa	19,794	34,646	60,642	106,144
<b>Total</b>	<b>370,113</b>	<b>647,817</b>	<b>1,133,889</b>	<b>1,984,671</b>

Source: LIRNEasia

This illustrates the inequality of the provincial demand projections. For instance, Uva province with a population of about 1,257,000 in 2006<sup>8</sup> is not projected to have a demand for more than 3,000 broadband connections by 2011. It will be only 15,750 even by 2020. Though not that low, demand from North Central and Eastern provinces too could not be expected to grow as rapidly as in some other provinces.

So the need to have high capacity fiber links to all locations is questionable. A more prudent approach will be to do a future demand and prospective supply study and to design the NBN to meet the current gaps, instead of oversupply. With the growth in low cost wireless technologies it would also be logical to have wireless backbones than making significant investments in laying fiber.

### **3. NBN per se will not offer any international, long -haul bandwidth as claimed.**

National level infrastructure creation per se will not increase international bandwidth, which needs to be purchased by operators. The statement that the NBN is connected to the SEAMEWE system is misleading. However, unit prices of international bandwidth usage may decrease with a significant volume increases and that will be the only impact NBN may have on 'increasing' international bandwidth.

<sup>8</sup> Department of Census and Statistics, Sri Lanka (2007), *Estimated mid year population*, Available at: <http://www.statistics.gov.lk/PopHouSat/PDF/p20%20Mid-Year%20estimates.pdf>. Accessed on 28/04/08

**4. NBN requirements should be defined in terms of fiber link capacities and not end user requirements.**

NBN is defined as a network capable of providing symmetrical 2 Mbps or more per end-user connection. Apart from the questions whether 2 Mbps limit is adequate (this is more the entry level now, while NBN is expected to cater the needs for at least another decade) or whether that has to be symmetrical (asymmetrical is more logical as most users download more than they upload) it is meaningless to define a network in terms of individual end user requirement. The required fiber capacities can be decided only after a systematic study of broadband demand and a comparison of that with the available and prospective supply. Otherwise, the outcome will be an oversupply of fiber capacity –which would lead to a large amount of dark-fiber<sup>9</sup>.

**5. No maintenance information is available.**

Maintenance is crucial to network performance. If NBN is government owned, it would be difficult to guess who would play this role. At present there is no government entity that can provide maintenance of fiber networks of that scale. The available options are (a) to create a new entity and (b) third party maintenance. Option (b) is more likely. However, it would be doubtful this is optimal or even viable. Not many operators want to take the risk of purchasing capacity from a link maintained by a third party.

**6. Use of a large number of technology options in ‘non trunk’ segments can have a negative impact on network performance.**

Ignoring the technology related inaccuracies in the document, it is understood that unlike in ‘trunk’, a large number of technologies are proposed to be used in the ‘non trunk’ segments. It is not clear whether there is a limit to the actual number of technologies used or the decision is entirely based on the requirement. Use of such large number of modes from fiber and copper based to Wireless based can only complicate the design and add to lowering QoS. This also creates additional problems in maintenance. So it is essential to have a clear design with limited number of technologies.

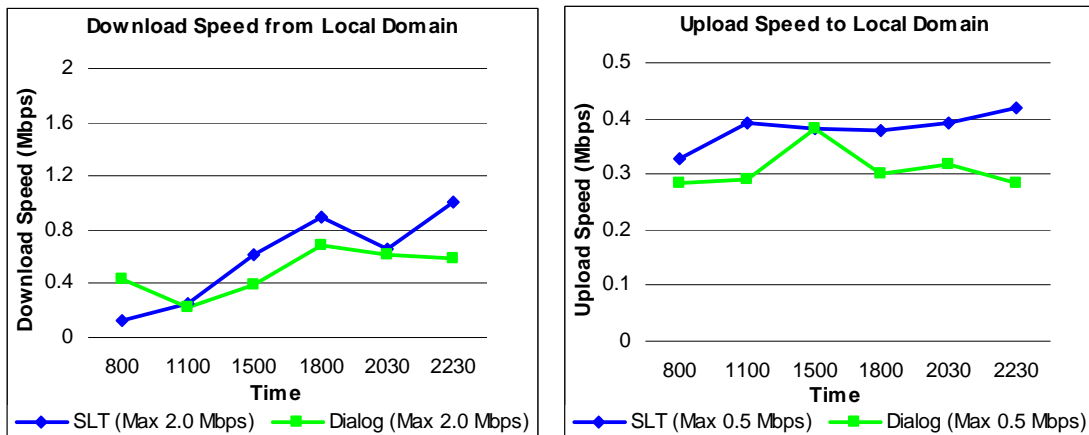
**7. Interconnection plan is essential.**

LIRNEasia broadband QoS benchmarking findings indicate issues that arise most probably due to poor interconnection. The download and upload speed variations when accessing a local server other than the ISP was significant. Although the throughput appears to be more acceptable compared to accessing an international server, the erratic patterns are disturbing.

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<sup>9</sup> What is Dark Fibre. Available at <http://www.wisegeek.com/what-is-dark-fiber.htm> Accessed on 28/04/2008

**Figures 6 & 7: Actual download and upload speeds of the business packages of two main broadband providers in Sri Lanka, tested during weekdays, accessing a local server (other than ISP's)**



Source: LIRNEasia, *Broadband Quality of Service Indicators, 2008*

No interconnection plan for NBN is available. To make matters further complex, interconnection is arbitrarily proposed at different levels. Apart from the possible regulatory issues this can again lead to an interconnection nightmare and inefficient network system where the end user will be the victim. Thus it is essential that a feasible interconnection design available before the implementation.

#### 8. The proposed ring structure may not be the optimal design

Ring structures offer certain advantages over alternatives. Better redundancy is one. However, ring structures might be more expensive and less scalable. Also the need for a ring structure is questionable given the non uniform demand for broadband services in different locations. So even if there is a requirement for more broadband services even at the rural level current design needs to be reconsidered depending on the projected demand.

#### 9. At a conceptual level the assumption that an island-wide NBN should be built with government funds is erroneous

The fundamental question is whether there has been a market failure in the provision of broadband services across the country and therefore whether the Government should get involved in building an island-wide NBN. The answer to this question is clear in the consultation document. It proposes an NBN that even covers the city of Colombo. Why should the Government use its resources (be it to subsidize via the USO fund or otherwise) to build backbone in Colombo? Is this a wise use of scarce state resources? In our view, the problem is two-fold: a market efficiency gap; and an access gap. The gap between the 'amount' of broadband services currently available and the commercially viable frontier can be closed by regulatory action. What is required is an effective access regime, not a publicly funded

backbone. If an appropriate access regime is not implemented it is certain that operators would build their own backbone in commercially viable areas. No public funding is required.<sup>10</sup>

The question will however remain with the access gaps (the frontier beyond the market efficiency gap), where the demand and supply of broadband services would be curtailed affordability and cost considerations. It is **only** in these areas that interventions may be required in terms of public funds; be it through USO funds or PPP or any other mechanism. Here again the need for a conducive regulatory regime would be paramount if the subsidies are to be effectively utilized for the actual purpose of affordable high-speed broadband access to the underserved.

**10. The lack of adequate broadband is not necessarily a supply constraint which seem to be the assumption in the consultation document**

The lump-sum nature of investment necessary for backbone infrastructure means that at a point below which certain thresholds demand is not met; such investment would not be feasible. It is thus important to understand the demand and supply conditions in the various areas in which possible intervention may be undertaken. The situation must be analyzed in terms of the existing demand; threshold demand and existing supply. Once this analysis is done, the TRCSL would be in a better position to assess the type of intervention necessary; whether it is to apportion some amount of USO funds to deal with the supply constraint or on the other hand to augment the demand. A comprehensive discussion on this subject is available in “One backbone, or two?” by Harsha Vardhana Singh and Rohan Samarajiva [2008].<sup>11</sup>

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<sup>10</sup> See op-ed piece in the Daily Mirror Financial Times of 08 October 2007 titled “Don’t waste public money on telecom infrastructure”. <http://www.dailymirror.lk/2007/10/08/ft/17.asp>

<sup>11</sup> Singh. H. V. & Samarajiva, R. (2008) “One back bone, or two?” In R. Samarajiva & A. Zainudeen (Eds.), *ICT Infrastructure in Emerging Asia, Policy and Regulatory Roadblocks* (pp. 163-190). Sage Publications