

Broadband is universally seen as the key driver for new growth, economic advancement and leadership for the 21st century. Leading economies in the European Union, South East Asia and even the US have attracted government interest, financial aid and to some measure regulatory intervention in an attempt to promote broadband penetration.

The significance of broadband was succinctly summed up by the ITU Secretary-General Dr. Hamadoun Touré while announcing establishment of a top level Broadband Commission for Digital Development in Geneva on 10-May-2010 when he said that “.....*In the 21st century, affordable, ubiquitous broadband networks will be as critical to social and economic prosperity as networks like transport, water and power....*” The Broadband Commission is a joint endeavor of ITU and UNESCO and will define strategies for accelerating broadband rollout worldwide and examine applications that could see broadband networks improve the delivery of a huge range of social services, from healthcare to education, environmental management, safety and more.

India is thus looking in the right direction at the opportune time with this consultation exercise initiated by the TRAI. In fact the elaborate, insightful and thoroughly researched consultation paper prepared by the TRAI itself provides answers to many issues raised herein.

We hereinafter attempt to give our suggestions on some of the issues raised in the consultation paper:

5.1 What should be done to increase broadband demand?

5.2 What, according to you, will improve the perceived utility of broadband among the masses?

Response: The Consultation Paper rightly recognizes that broadband growth predominantly depends upon **perceived utility**. Whilst the perceived utility of broadband in urban areas is not a major cause of concern and can be taken care by market forces, the public awareness in rural areas requires considerable groundwork to be done in which the local self governments, municipal bodies, NGOs, self-help groups etc. have a crucial role to play. The rural masses have to be systematically educated about the pervasive advantages of broadband in proliferation of opportunities, economic prosperity, greater engagement, social cohesion, women's empowerment, improved governance, eco-friendly growth and promoting cultural diversity. The perceived utility of broadband in terms of access to better medical & health facilities, public utility services, insurance, tele-education, digitization of land, birth,death records, net-banking, e-democracy etc. has to be persuasively communicated and realistically demonstrated at appropriate multiple forums such as grameen bazaars, haats, fairs, panchayats, village post offices, self-help groups, government run projects etc. to attract rural masses to fuel the demand for broadband.

Besides perceived utility, the other major factors influencing demand are availability of useful applications, regional language content and affordability. Development of relevant content for community use (at CSC) will attract rural masses to see the benefits such as job search, tele-medicine, latest news on agricultural research, seed production, crop prices and livestock breeding, trading in commodities, weather forecasts etc. It is also necessary to ensure that the community service provided should be subsidized to encourage rapid uptake and it would be desirable if some content and service should be provided free of cost.

5.3 What measures should be taken to enhance the availability of useful applications for broadband?

Response: Development of useful applications for broadband is inter alia dependent on the connectivity. Presently, broadband is concentrated in urban areas alone and fibre connectivity to villages is negligible. As a result, the entertainment segment (video, gaming and business enterprise) has attracted most attention and development of applications for community & social benefit remains largely untapped. With an assurance of investment for spread of broadband in rural areas in the form of public spending, it is expected that useful applications for broadband that are rural centric will see greater activity.

5.4 How can broadband be made more consumer-friendly especially to those having limited knowledge of English and computer?

Response: The Paper aptly notes that a more interactive kind of communication is needed for the consumer having limited or no knowledge of computers eg. use of Graphical User Interface (GUI) in which people who are not able to understand the languages interact with the applications more with the help of pictures and graphics, than language.

Computer literacy programs/ workshops should be launched among the masses at all levels of community especially in villages to give them a basic knowledge of computers. To promote computer literacy, the government should make computer education at primary school level mandatory.

In fact the applications (e.g. e-governance, e-health, tele-medicine etc) that have potential to transform rural India, should be developed in advance and pilot runs must be performed in various states/villages to ensure its long-term success and ecosystem development. The government should pursue the national e-governance plans with special focus on rural masses with renewed vigour for a timely completion.

5.11 Is non-availability of optical fibre from districts/cities to villages one of the bottlenecks for effective backhaul connectivity and impacts roll out of broadband services in rural areas?

5.12 If so, is there a need to create national optical fibre network extending upto villages?

5.13 In order to create National optical fibre core network extending upto villages, do you think a specialized agency can leverage on various government schemes as discussed in para B?

5.14 Among the various options discussed in Para 3.35 to 3.37, what framework do you suggest for National Fibre Agency for creating optical fibre network extending upto village level and why?

5.15 What precautions should be taken while planning and executing such optical fibre network extending upto villages so that such networks can be used as national resource in future? What is suitable time frame to rollout such project?

Response: Yes in our opinion the non-availability of OFC from cities/metros to villages is adversely impacting roll-out of broadband in rural areas and it is desirable for India to create a nation-wide optic fibre network as has been done in several other countries listed by TRAI in the Paper. This would require a concerted and coordinated effort on the part of the government and private sector to develop a robust, efficient and scalable national broadband infrastructure.

(a) This nation-wide broadband network comprises access and core network as follows:

- **ACCESS NETWORK:** The *access network* or *last mile connectivity* for broadband should ideally be technology neutral eg. DSL, OFC, BWA, WiMAX, WiFi etc. although we foresee that there is likely to be a preference for wireless access network in view of speedier availability, farther reach and availability of 3G and BWA spectrum auctioned recently. Spectrum in the 700MHz & 900MHz bands should be made available at the earliest by re-farming it from its existing uses. 900MHz has a fairly good ecosystem of equipment for deployment of 3G /wireless broadband. It is widely acknowledged that 900MHz, owing to its better propagation characteristics relative to other spectrum bands in operation, is the best suited for Broadband service in rural areas. Several countries are already in the process of re-farming 900MHz band and auctioning the same for this purpose.
- **CORE NETWORK:** OFC is widely perceived as the optimum resource for bandwidth in core network. As pointed out in the Paper, the National Plans for building broadband infrastructure have received significant State funding almost universally. It is suggested that in India, the inter-city connectivity should utilize the existing ducts/OFC deployed by any agency/service provider and government should grant subsidy only for incremental fibre to be extended to the villages. The money in the USO fund should be utilized for such grants/subsidy. It is also suggested that agencies/service providers that own ducts/OFC/bandwidth in terms of E1s should be mandated to share these resources in the larger national interest at pre-determined prices.

(b) The TRAI has done a commendable job in compiling statistics on availability of optical fibre cable in India. However we estimate that the actual fibre availability is higher than TRAI's estimate of 7.5 lac route kms (refer table below).

S. No.	Operator	Duct Route	OFC Route (KMs)	Source/Ref.
1	BSNL	N.A	595,393	As on 31.03.2009 BSNL AR 2008-09
2	MTNL	N.A	8,938	Research: MTNL's Fiber KMs converted to RKMs by dividing it with 48 fiber cable
3	TTML	N.A	10,000	Research & Estimates
4	TTSL	N.A	70,000	
5	Bharti	N.A	126,357	As on 31.03.2010 Airtel Q4 '09-10 Report
6	RCOM	160,000	190,000	As on 31.03.2010 RCOM Q4 '09-10 Report
7	Tata Communications (VSNL)	N.A	36,000	As on 31.03.2009 Tata Comm Form 20-F '08-09
8	GAILTEL	N.A	13,000	Gail website
9	Railtel	N.A	52,141	As on 31.03.2010 Railtel website
10	PGCIL	N.A	20,500	PGCIL AR 2008-09
11	Total Route KMs	160,000	1,122,329	

(c) We favour the third option/framework proposed by TRAI in para 3.37 for establishing a National Fibre Agency for creation of OFC network extending upto the village level. The agency should be a consortium

of service providers (both PSUs and private sector) whose contribution to the assets and resources pool of the agency should determine their equity participation in the agency. This agency should identify areas where additional focus and investments are needed in order to extend the fiber connectivity and avoid duplication of resources.

- (d) In this context, it is imperative to map the current fibre availability on a GIS platform to identify gaps. The gaps in availability of ducts, once identified, could be funded from the USO fund along with the cost of equipment. Labor should be drawn under employment guarantee schemes like MGNREGS i.e. Mahatma Gandhi National Rural Employment Guarantee Scheme as suggested in the Paper. It is reiterated that USO funding should be utilized to fill in the gaps in the areas where there is no OFC/Duct connectivity currently available and government (State/Central) is desirous of extending the fiber there. To identify such areas, availability of a national Fiber/Duct database which is based on real-time information is indispensable. These areas would then be evident once a pan-India Master Plan in the GIS format is readily available to this agency and ready to be used by any operator if it wants to go and serve in such areas or government mandates. We gather that Reliance Communications already has such a powerful tool and database with satellite imagery of all habitations with their duct/fibre availability plotted on it. This could be developed further into a national database by populating information from other service providers who have duct/fibre on the ground.
- (e) To fulfill this objective, all operators should be mandated to share the information/maps of their OFC/ducts deployed/being deployed with this Agency, so that a master plan and database based on GIS system can be developed. The core network must be available in Geographic Information System (GIS) in this Master Plan. This should include details of extent of fibre availability regionally and expansion requirement. A large number of ducts/fibre/copper is already crisscrossing the territory of India passing through highways, forests, talukas and villages. The National Fibre Agency would coordinate with the NHAI and various state/ local level agencies to ensure the merging of fibre expansion plan with the design of road/ highways plan.
- (f) A variegated repository of Applications that would ride on this infrastructure should be made ready so that as and when infrastructure is available, it can be deployed and the benefits could be reaped without wasting time in development of applications.
- (g) The National Broadband Network Plan proposed above should be lead by an experienced and seasoned professional like Mr. Sam Pitroda who can exert influence and pressure and has the political acceptability to see a project of such magnitude through.

5.16 Is there a need to define fixed and mobile broadband separately? If yes, what should be important considerations for finalizing new definitions?

5.17 Is present broadband definition too conservative to support bandwidth intensive applications? If so, what should be the minimum speed of broadband connection?

Response:

Broadband Definition - As far as India is concerned, it is desirable to have separate *definitions*. This could help in providing focused discussions and recognize that there are differences, both in terms of technology, applications and usage. However due care should be taken while applying separate terms as there may be times when it is tempting to favour one over the other, but may not be fair from a policy perspective.

Broadband Speed - The current broadband speed of a minimum of 256 Kbps for interactive services including Internet Access is not futuristic and may be out of sync considering that this was fixed under the National Broadband Policy in 2004. But as more and more people are becoming aware of broadband applications like video-conferencing, telemedicine, business process outsourcing etc. which can only be supported by much higher bandwidth than 256 Kbps prescribed currently. We suggest that a minimum speed for Broadband connection may be defined as 4 Mbps considering the latest and future applications being developed and their bandwidth requirements.

5.18 What specific steps do you feel will ease grant of speedy ROW permission and ensure availability of ROW at affordable cost?

Response: As discussed in the Paper, the TRAI has previously given far-reaching recommendations on streamlining the ROW but sad little has been done over the past decade to alleviate the predicament on the ground. As a consequence, the ROW permissions remain a costly and tedious affair. The autocracy of State governments stand in the way of adoption of a uniform pan-India ROW policy guidelines and the broadband vision and targets set by the government therefore continue to elude us. There is a pressing need to address the current ROW anomalies wherein the state governments and even the various municipalities within states, work differently. Until this ROW rigmarole is untangled in a diligent manner to create a uniform simplified regime, our vision to meet broadband targets and usher in the information superhighway would continue to elude us. We are of the opinion that unless a serious coordinated effort is initiated on the part of the central and state governments, spurred by strong political will, this will fail to see the light of the day. Most importantly:

- ROW permissions for broadband (i.e. laying OFC, Ducts) must be treated separately and on priority relative to normal ROW permissions as already recommended by TRAI previously. The vision of economic development through new age economy cannot be achieved until each house is connected through fiber.
- No ROW clearance charges should be levied. Service Provider should be responsible to restore the land to original form after completion of trenching work for laying duct/fibre.
- In fact the planning of railways, roadways and highways itself should incorporate OFC/Ducts on new routes through GIS/GPS system as elaborated above. As the government envisions that almost 11 Lac KMs of new road connectivity is required to cover 3.74 lakh villages having more than 500 inhabitants each, this is also the right time to incorporate the OFC/Duct in this planning to avoid any future bottlenecks.
- A maximum time limit should be fixed for these clearances after expiry of which it should be deemed cleared. Similar stringent time frame should be set for the service provider to complete the job for which the ROW permission was sought.

5.19 Does the broadband sector lack competition? If so, how can competition be enhanced in broadband sector?

5.20 Do you think high broadband usage charge is hindrance in growth of broadband? If yes, what steps do you suggest to make it more affordable?

Response: The high cost of CPEs and provisioning of broadband services coupled with non-availability of broadband service in smaller towns/cities and rural areas indicates lack of competition in this segment. Primarily this can be attributed to the fact that a broadband enabling robust infrastructure with sufficient return on investments (RoI) is not yet available to service providers for them to invest in extensive roll-out. Recently DoT has auctioned 3-4 blocks of 3G and 2 blocks of BWA spectrum in all service areas aiming to provide broadband wireless services to all masses including rural areas. To encourage winners of spectrum to speedily rollout services, more spectrum e.g. in 700MHz band 50 MHz + 50 MHz AND 900MHz band should be made available. The broadband sector also needs competition to encourage the existing operators for expansion and providing service at affordable cost.

5.31 What measures do you propose to make Customer Premises Equipment affordable for common masses? Elaborate your reply giving various options.

Response: Local manufacturing units of CPEs should be developed in India. Bulk production or bulk import of CPEs may also reduce per unit price to the customer. Excise and custom duties should be reduced on import of the CPE. Government should encourage PC/ Laptop manufactures and vendors to integrate the modems with the device at the time of manufacturing them which will facilitate faster and easier adoption of service.

5.32 What measures are required to encourage development of content in Indian vernacular languages.

Response: The hiatus in the level of English literacy and availability of regional language applications is one of the factors dampening growth of broadband in India. Measures to encourage development of vernacular content include:

- E-governance initiatives for community & social development
- Internet Data Centre (IDC) to host and develop the contents in regional languages

5.33 Do you perceive need for any regulatory or licensing change to boost broadband penetration?

Response: Certain measures to boost broadband penetration can be:

- Licensing Niche Operators to provide broadband services in rural & remote areas and giving them incentives like subsidized spectrum, USO funding etc.
- Time bound creation of a national OFC/Duct Master Plan, simplification of ROW procedures
- Strict rural roll-out obligations for BWA Auction winners
- Mandatory infrastructure sharing by Incumbents, local loop unbundling
- Creation of a National Broadband Master Plan