Date 2010-07-20
Reference EIL/B-10:0041
Your Date 6th May 2010
Your Reference No. 9-3/2010-CN

Attending to this matter
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Response to TRAI Consultation Paper on National Broadband Plan dated 10th June 2010

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Dear Sir,

Thank you for offering us the opportunity to provide inputs to the consultation paper on a National Broadband Plan for India. We agree that the broadband access is critically important for social and economic development and believe wireless broadband will play a significant role in delivering broadband access in India.

Broadband provides the opportunity to do things differently, achieve better outcome for people, and ensure continuous growth of economy and social development. It will help India to become a truly competitive knowledge based economy and leverage citizens to become healthier, better educated and more engaged in their community & society. It also has the ability to transform other industries such as health, education, governance, transport, media, and utilities. It has a power to create new business models that will change the way we work and live. People now want broadband everywhere, wherever they are.

We also believe and support it will take a mix of technologies and delivery mechanisms to meet government ICT goals (20M by 2010 is now unachievable, however 100M by 2014 would be) once government initiative align the initiative to a complete and inclusive structure.

We agree with the Authority that there is an immediate need to improve broadband penetration amongst masses especially in rural areas. We have tried to cover our honest opinion to address and respond to most of the issues highlighted through this consultation paper.

1. **What should be done to increase broadband demand?**

   Comments;

   - To increase demand for broadband and improvement in rural penetration a good infrastructure needs to be built. To build a good infrastructure the Fiber can be laid along the roads and can be proposed to be part of basic necessity as road, education and health program of govt.
   - Govt. can also provide funds to help operator to roll-out broadband connectivity as an access in rural areas. For e.g. this can be funded through USOF funds. Also roll-out of Fiber in village, Panchayat and Tower locations can generate earnings for the villagers as part MGNREGS scheme.
   - The existing mobile infrastructure can be leveraged upon to increase the broadband penetration and awareness.
   - Lower frequency bands options shall be explored, as it has a better propagation, penetration characteristics along with Spectrum efficiency.
   - The broadband affordability and availability must be transparent to attract users from both rural and urban areas.
   - Applications for rural areas can be developed which can be in different vernacular languages or GUI based to ensure the end-users is able to use the applications. The GUI will help to overcome the barriers of low penetration of computer and English literacy.
   - Subsidiary to OEM vendors and CPE / Net books / Smart Phones manufactures to encourage rural penetration and build high speed networks.

2. **What, according to you, will improve the perceived utility of broadband among the masses?**

   Comments;

   - The roll-out of 3G and BWA will improve the broadband penetration among the masses. As there is no speed limitation such as in copper, the wireless access technology can provide quick roll-out and availability of higher speeds in a short span. Hence the time taken to reach the masses is reduced and better broadband speeds are offered to address various bandwidth hungry applications.
   - In Urban India the perceived utility is improved by providing higher and higher bandwidth at affordable rate to the masses who they have become bandwidth hungry due to social networking, On line gaming, Video on demand (You tube), Mobile TV etc.

- In rural India, various Government initiative and availability such as below will improve the perceived utility;
    a. eGovernace => In the rural areas Govt. plans for opening Bharat Nirman Kendra to serve as a single stop for all Govt. schemes and serve as a local administrative hub providing easy access to information can be established using the broadband network services.
    b. eEducation => Right to education (RTE) can also be established where teacher can teach the students of few neighboring villages through real-time video sessions running on a high capacity backbone network (Mix of Fibre and High Capacity Microwave).
    c. eHealth facilities can also be extended to villagers who cannot travel to cities for medical facilities. A doctor sitting in a city can interact with the patient in remote village. The patient's heart beat, pulse etc can be transmitted back to the Doctor for diagnosis.

    These are the few examples presently appears as the needs of a human being associated with the Broadband, and move forward to the next level. Once addressed will create an awareness of the broadband and its utility towards a common masses.

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

Comments;

- We believe all the network such as 3G, LTE, CDMA and GSM etc has a capability to support desired application for the rural populations hence a focus need to be aligned towards making best use of these applications through GUI, Vernacular and affordability of the terminals. Applications such as below would support the utility and penetration specially in rural areas;
    a. e-Education will help in increasing the literacy rate will bring increase demand in the rural areas.
    b. e-Governance would help in creating the demand in rural areas where the villager needs to travel to the nearest government office to get his application submitted.
    c. e-Health care system can be implemented to improve the healthcare services in rural India, which would fuel the growth of bandwidth hungry applications.

4. **How can broadband be made more consumers friendly especially to those having limited knowledge of English and computer?**

   Comments;

   - The Right to education scheme can be used to promote English and Computer literacy in rural areas which is one of challenges in broadband penetration. Computer literacy should be made compulsory in the primary schools including Govt. schools to create awareness.
   - Govt. can fund the required infrastructure like low cost desktops, CPE's, smart phones, netbooks to create and spread awareness.
   - Develop easy to-use applications which can be in various vernacular languages or language agnostic to increase demand for higher speeds and bandwidth. Simple devices with icons will help to drive the masses towards broad band.
   - Train a group of villages/Users to run the Bharat Nirman Kendra in Village Panchayat to run these as one stop shop for all their Govt. schemes and local administrative queries.

5. **Do you agree with projected broadband growth pattern and futuristic bandwidth requirements?**

   Comments;

   - The trend in developed countries including India shows that the growth of broadband has grown exponentially in the recent years. In India the growth from Sep'08 till March'10 has almost doubled. With the roll-out of BWA and 3G networks there will be demand for more bandwidth and speed in Metros, tier I and tier II cities. In rural areas the broadband penetration is almost nil, the demand and awareness for broadband needs to be created, where a villager will use user friendly applications on easy to uses CPE/ low cost desktop/ smart phones to meets their basic information needs. As large population of India lives in the rural areas which are largely untapped, awareness, demand and applications will increase the bandwidth requirement in future.
   - We believe for urban India the broadband need is touching speed of >3 Mbps as there are many newer applications in the pipeline such as Video on Demand, Video Gaming which would be bandwidth and speed hungry. We also anticipate this speed should be around 5 Mbps for next 2 years and then after the demand will grow and may touch up to 100 Mbps. Also there would be more than one user per household which needs higher and better connectivity along with speed. The speed during mobility would also be desired and needed by Urban India.

- In rural India, speed is not the key however infrastructure, awareness, affordability, easy to use applications is the immediate requirement.

6. **Do you agree that existing telecom infrastructure is inadequate to support broadband demand? If so what actions has to be taken to create an infrastructure capable to support futuristic broadband?**
   Comments;
   - The existing infrastructure is inadequate as we perceive. The existing Core and backhaul networks are to be expanded with government initiatives and support to reach the masses. Government also needs to encourage the Operators to roll-out the access network to reach the masses. Wireless access network is the quick and optimal way to reach the Govt. plans for broadband penetration. To achieve this, need of good backbone network (mix of Fibre and high capacity microwave) up to village Panchayats, CSCs and/or Tower locations is required in rural areas through government initiative and funding. For the access network, the best alternative would be to let the operator decide on the type of access technology to serve the end-user. The required bandwidth and speed on the Access side can be served using GSM, 3G BWA etc. It is envisaged that the Urban areas will be served by 3G and BWA technologies however Rural could start with GSM as well. Also as these technologies evolves towards IMT, higher speed ~ 1Gbps can be achieved as it evolves.
   - We shall also synergized the available backbone network of PSU and private operators in a Public – Private partnership umbrella to reduce the investment and quicker availability of backbone network for broadband availability on a Cost based model.

7. **What network topology do you perceive to support high speed broadband using evolving wireless technologies?**
   Comments;
   - The network topology for the core and middle mile connectivity could be based on mix of Fibre and high capacity microwave.
   - The access technology should be technology agnostic and kept open for various technologies such as GSM, 3G and BWA etc.

8. **Do you see prominent role for Fibre based technologies in access network in providing high speed broadband in next 5 years? What should be done to encourage such optical Fibre to facilitate high speed broadband penetration?**

Comments;

- In Urban, yes it is feasible however in Rural the roll-out of Fibre based technology in access network would be challenging due to high cost of roll-out. It's our suggestion to first create a demand for higher speed and bandwidth, and then the infrastructure can be evolved. In these areas we can achieve high speed broadband penetration by using emerging wireless technologies which can meet the future requirements as the speed requirements goes up.

9. **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?**

   Comments;

   Yes, the non-availability of optical Fibre to villages is a bottleneck. Due to high investment in laying out the Fibre to the villages the operators have not rolled out Fibre to villages. Operators are also concerned about the right of way (ROW) issues varying from state to state hence the rollout of broadband services.

10. **If so, is there a need to create national optical Fibre network extending up to villages?**

    Comments;

    Yes, there is a strong need to create national optical fiber network extending up the Village Panchayats, CSCs and Tower locations.

11. **In order to create National optical Fibre core network extending up to villages, do you think a specialized agency can leverage on various government schemes as discussed in para B?**

    Comments;

    A public private partnership can be created to roll-out Fibre to the rural areas and the infrastructure of all operators can be shared by and between different operators to serve the rural masses. The major percentage of cost of the project to the tune of 58% is for the unskilled labor, which would be distributed between different operators. The cost and monitoring of the project initially need to be managed and financed by the various Govt. schemes available, like USOF, MGNREGS, and NRRDA and then after PPP model takes it forward.

This specialized agency (PPP) will also be helpful as it can then act as a single window towards the Govt. agencies and towards the operators and ROW approvals, combining available backbone infrastructure of various leading operators on a Cost Model etc.

Broadband shall be seen as a basic necessity similar to electricity, this specialized agency (PPP) in government support can ensure rolling out Fibre to rural areas while lay-it along the road with future expansions planned. The agency can then also lease out the infrastructure to various operators based on their needs.

12. **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 up to village level and why?**

    Comments;

    Combination of para 3.35 and 3.36 suits best for the framework, where there is one autonomous national agency for smooth and timely implementation and administration of network. The existing infrastructure of PSU and Private Operators is transferred to the agency and is being shared with various operators. USOF funds along with other source of funds can be used to fill the Gap of existing optical network and covering 250K Village Panchayats, CSCs and Tower locations.

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

    Comments;

    When planning and executing an optical Fibre network to be extended up to villages the use of existing infrastructure available with all the operators like BSNL, private players, Railways and PSU can be combined and used to connect the village Panchayat, CSCs and Tower locations . The access network however shall be kept open with TSPs. As this network and agency is set up by Government initiative, directives, and policy guideline changes, this combined resource is available as “National resource” in time of critical requirements.

    Our projections for the time taken for roll-out shall be between 2 ~ 3 years in Phases manner (Phase 1 to cover 250K villages including CSC’s and Phase II covering all villages).

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

Comments;

No, there is no requirement to define two access technologies differently. As wireless and wired technology will co-exists in our country due to constrains in geographical terrain, existing policies, etc hence having two different definitions for technologies would not be beneficial for the growth for entire broadband eco-system.

2G, 3G and BWA etc. will play a crucial role as their roll out time is less.

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

Comments;

Our estimation is that for urban areas speeds of >1 Mbps will be needed however in rural areas the requirement can be fulfilled even with 256Kbps. As the demand goes up the system should be capable to support higher speeds and bandwidth. Applications like VoD, Online gaming, video streaming; would require 3-4 Mbps minimum in Urban. There will be more and more applications in future which would be bandwidth hungry.

16. **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?**

Comments;

- Urban consumer today opts for unlimited broadband schemes due to lack of transparency of the tariffs and their usage patterns. To safe guard the consumer interest and educating them feasibilities of informing the subscribers about their usage details should be made available at their convenience (Ex. Monitoring data usage while surfing the internet). This will help to enhance their confidence in increasing the demand of internet usage and creating demand for bandwidth.
- Subsidized tariff plans will help to enhance the acceptability and usage of broadband in rural areas.
- Steps => The mobile subscriber show an exponential growth of the mobile users. These subscribers can be converted into mobile broadband with evolving the existing network and as the cost of converting this subscribers would be minimal, it could be passed on to the consumer and offer reduced tariff.

17. **Do you think simple and flat monthly broadband tariff plans will enhance broadband acceptability and usage?**

Comments;

- Yes, to enhance the internet usage, the first step would be educating the consumer on their usage pattern and suggesting the best tariff along with transparent tariff structure.
- To enhance the user experience and creating a demand innovative tariff plans with fixed fees structure will be helpful. The tariff plans for the subscribers in rural areas and urban areas can be different to tap the largely untapped rural market.

18. **QoS of broadband, availability of bandwidth, adherence to given contention ratio, affordability, availability and spread are some intricately linked parameters. In your opinion what should be done to ensure good quality broadband to subscribers?**
    Comments;
    To ensure good quality of broadband to subscribers apart from the parameters listed above the following parameters should also be considered,
    - Download throughput
    - Upload throughput
    - Latency
    - Data usability

19. **Do you think that bad quality of broadband connection is impacting the performance of bandwidth hungry applications and hence crippling the broadband growth? If so, please suggest remedial actions.**
    Comments;
    Yes, the qualities of service given to end users are needed to be improved. For e.g. its perceived by the end user that the committed speed is never achieved for which he has subscribed. To improve the Broadband Quality Service (BQS),
    - Packet loss, jitter, service throughput
    - Download throughput
    - Upload throughput
    - Latency

    If the above parameters are improved upon we will have good penetration also the bandwidth hungry applications needed for growth for rural masses can be developed and improved upon. The improvement of broadband penetration will also aide in increasing the per capita GDP growth of the country.

20. **Is there a need to define new/redefine existing quality of service parameters considering future bandwidth hungry applications, time sensitivity of applications**

and user expectation? What should be such parameters including their suggestive value and should such parameters be mandated?

Comments;

The BQS for India is currently less than 10. Application available in future will be bandwidth hungry and sensitive to delays and jitters. Tomorrows applications would need a better BQS, the network evolution in the country should factor this during the build up of broadband network and should be part of the broadband regulation framework apart from the guaranteed upload, download throughput and latency.

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

Comments;

The cost to reduce the CPE for the rural masses can be achieved by;

- Providing incentives through fiscal policies through reduction of taxes and levies for mobile broadband devices.
- Stimulating investment for the domestic manufactures for boosting indigenous production.
- Recycling of the old PC / laptops for making CPE's affordable.
- Low cost netbooks with thin client applications.
- Bundling of netbooks / PC / Laptops / Smart Phones etc along with broadband subscriptions.

22. **What measures are required to encourage development of content in Indian vernacular languages?**

Comments;

Given India's IT strength and the recent trends in traditional entertainment industry, infotainment we can over come the challenges of English language which is one of the barriers in growth of broadband in the country.

Govt. can develop a framework which would aid in developing the applications or GUI which can help in broadband penetration. The application can be developed in vernacular languages or GUI based application which can aid in increasing literacy and broadband penetration in the rural areas. Alternatively the web-sites can have option to choose the language in which the users want the information.

23. Are there any specific competitions and market related issues that are hindering growth of broadband?

Comments;

Hindrance towards the growth of broadband seems to be,

- Poor infrastructure.
- ROW procedures are not uniform across the states and is time consuming.
- High cost of International Internet Broadband.
- Poor Broadband Quality Score.
- Hosting of localize contents on servers within country.
- Framework for routing of domestic traffic within the country.
- Market dominant only by two major players.
- Cost of mobile broadband devices.