General:

CII has always been emphasizing that the unprecedented transformation in the Telecom sector has been primarily achieved through consistent reforms, innovative policies and putting together a vision of all stakeholders.

India has witnessed a remarkable growth story with the telecom sector, especially in the wireless segment. The increasing use of mobile phones in rural areas has brought about drastic changes in the lives and livelihoods of rural Indians. Mobile telephony has enabled significant social, financial and economic inclusion, led to the creation of a strong ecosystem and thriving business models; and created disruptive value at the bottom of the pyramid.

The facilitating role of the Government and the Regulator, coupled with innovative approaches adopted by the Operators, as demonstrated about a decade ago for cellular voice services and which resulted in the massive growth and affordability, connectivity and accessibility for these services among masses, is required for broadband services also. Innovative approaches are required for the present scenario of broadband.

For demand to be generated automatically, these services will need to be relevant and affordable to the rural masses, and commercially viable for the service providers. This calls for robust Public-Private partnerships, with active involvement of the local governing bodies.

Issues for Consultation

Q1. What immediate measures are required to promote wireline technologies in access networks? What is the cost per line for various wireline technologies and how can this cost be minimised? Please reply separately for each technology.

There is a need to incentivise MSO, LCO and Service providers to roll out DOCSIS 3.0, FTTH services to rural areas.

Implementation of Digitization of Cable to Tier 2 and Tier 3 cities in a time-bound manner would help broadband penetration through cable.

Q2. What are the impediments to the deployment of wireless technologies in the access network? How can these deployments be made faster? Please reply separately for each technology.

Expansion of mobile networks requires both spectrum and sites, with spectrum particularly important for bandwidth. The government's spectrum strategy :

- Should allow 700MHz for commercial use for providing broadband to masses at large.
- Enable Spectrum Refarming
- Assign appropriate spectrum (5470-5725 MHz be allocated) for unlicensed Wi-Fi operation and supportive regulations for Wi Fi technologies to accelerate Broadband.
- Release of extended spectrum in frequency 2100 MHZ band

The wireless broadband networks require large investments, especially to cover the rural areas. Some incentives (e.g. relief in licence fee and / or SUC for wireless networks used for Internet / broadband services) need to be provided to operators, who roll out their networks in such areas.

Q3. The recommendations of the Authority on Microwave backhaul have been recently released. Are there any other issues which need to be addressed to ensure availability of sufficient Microwave backhaul capacity for the growth of broadband in the country?

The Government decision on the TRAI recommendations should be made known quickly. Also, in line with the NTP-12 stipulations, efficient use of spectrum (including Microwave spectrum) should be encouraged and incentivized.

Q4. The pricing of Domestic Leased Circuits (DLC) have been reviewed in July 2014. Apart from pricing, are there any other issues which can improve availability of DLC?

Q5. What are the specific reasons that ISPs are proactively not connecting with NIXI? What measures are required so that all ISPs are connected to the NIXI?

Q6. Would the hosting of content within the country help in reduction of the cost of broadband to a subscriber? If yes, what measures are required to encourage content service providers to host content in the data centre situated within India?

Along with hosting of content within the country, the locally relevant & useful content should be developed. The customers would be willing to pay for the service and content, if it benefits them, saves time & effort for them, increases their productivity & earnigs and / or makes their life easier.

Q7. Are PSUs ideal choices for implementing the National Optical Fibre Network (NOFN) project?

A viable business model still eludes the private sector players in reaching to rural masses. As a measure to trigger demand, it will be good for PSU to build basic infrastructure providing non-discriminatory connectivity to retail service providers and entrepreneurs.

We would also recommend extending BBNL Operating mandate from being a Netco to an integrated E2E Netco (Passive) as well as Opco (Active infrastructure) offering wholesale services to Retail SPs

- Hundreds of Gbps in Core and tens of Gbps aggregation capabilities are needed for this upcoming data deluge (most SPs today have 2.5Gbps STM-16 and that too in top 100 cities only)
- Retail service providers (/last mile local operators) would prefer a SPOC (vs. interfacing with multiple providers (of core, agg, access, etc.)
- Would result in better monetization of Govt.'s investments (vs. dark fiber only)
- Other BRIIC countries (e.g., Russia- Rostelekom, China- China Telecom, Brazil-Telebras) as well as developed countries (e.g., Australia NBNCo) have adopted same models to reduce risk and deploy quickly; Many like China Telecom offer last mile services as well
- Incentivize private companies to invest in the least developed areas specially rolling out FTTH, DOCSIS3.0, WIFI and 3G/LTE access.

Operating Model for Broadband Eco System
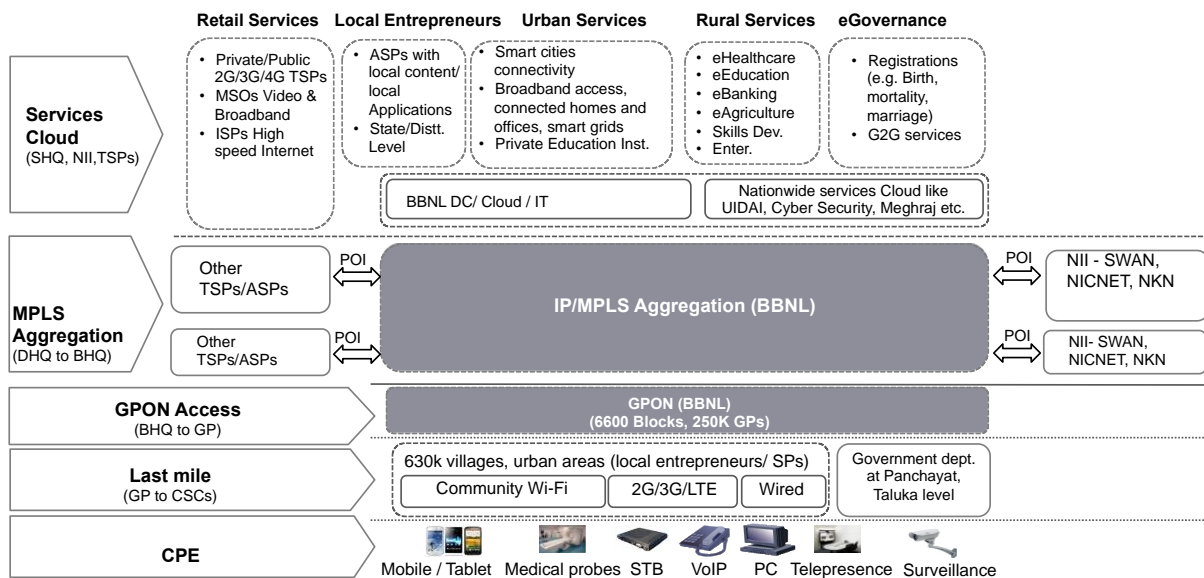
Additionally, CII had prepared a study, which dwells in detail about implementation of NOFN, copy of the report is attached for reference.

Q8. Should awarding of EPC turnkey contracts to private sector parties through International Competitive Bidding (ICB) be considered for the NOFN project?

Yes

Q9. Are there any ways in which infrastructure development costs can be reduced? Is it possible to piggyback on the existing private sector access networks so as to minimize costs in reaching remote rural locations?

Please refer to the CII paper Deployment Models and Required Investments for Developing Rural Broadband Infrastructure in India, which has suggested an innovative model of reverse auction.

All networks – belonging to PSUs or private operators, should be optimally used for spread of broadband in the country.

Q10. What can the private sector do to reduce delivery costs? Please provide specific examples.

Q11. What are the major issues in obtaining right of way for laying optical fibre? What are the applicable charges/ constraints imposed by various bodies who grant permission of right of way? In your opinion what is the feasible solution?

Q12. Should the Government consider framing guidelines to mandate compulsory deployment of duct space for fibre/ telecommunications cables and space for telecommunication towers in all major physical infrastructure construction projects such as building or upgrading highways, inner-city metros, railways or sewer networks?

One of the cost and time factor for extending the OFC to villages is digging the trenches for cables. The village panchayats covered under the scheme should be encouraged to get the trenches dug under NREGA / MNREGA schemes. This would reduce the time as well as cost for laying the OFC network. The benefit for the villages (Panchayats) would be that they would get the broadband network faster.

Q13. What are the impediments to the provision of Broadband by Cable operators? Please suggest measures (including policy changes) to be taken for promoting broadband through the cable network.

Implementation of Digitization of Cable to tier 2 and tier 3 cities in time bound manner would help broadband penetration through cable.

Q14. What measures are required to reduce the cost and create a proper eco system for deployment of FTTH in the access network?

Q15. Are there any regulatory issues in providing internet facility through Wi-Fi Hotspots? What are the reasons that installation of Wi-Fi hotspots has not picked up in the country? What type of business model needs to be adopted to create more Wi-Fi hotspots?

Assign appropriate spectrum (5470-5725 MHz be allocated) for unlicensed Wi-Fi operation and supportive regulations for Wi Fi technologies to accelerate Broadband.

Q16. What are other spectrum bands which can be unlicensed for usage of Wi-Fi technology or any other technology for provision of broadband?

At present, 433 MHz of spectrum in 2.4 GHz and 5 GHz bands is available for usage by indoor Wi-Fi systems, out of which 133 MHz is available for outdoor usage as well. All this de-licensed spectrum should be optimally utilized for best results.

Also, the government should open the use of 'White Spaces' in TV UHF bands on priority. The UHF band would provide much larger coverage and better in-building solutions, as compared to 2.4 and 5 GHz bands.

Q17. How much spectrum will be required in the immediate future and in the long term to meet the target of broadband penetration? What initiatives are required to make available the required spectrum?

Many studies and assessments have been made in this regard. The government should provide a roadmap for availability of additional spectrum.

Q18. Are there any other spectrum bands apart from the ones mentioned in Chapter-2 to be identified for provision of wireless broadband services?

It is desirable to use the globally harmonized bands, where the ecosystem becomes mature quite quickly and economy of scale is available.

Q19. What are the measures required to encourage Government agencies to surrender spectrum occupied by them in IMT bands?
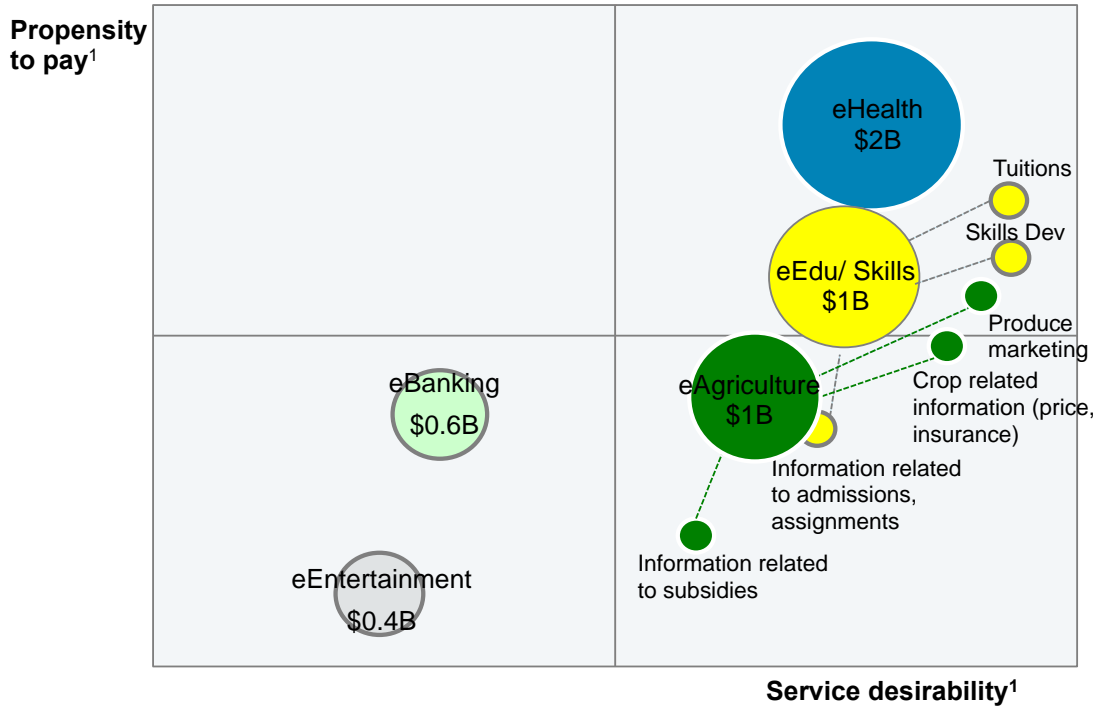
Q20. What should be the time frame for auctioning the spectrum in 700 MHz band?

The ecosystem for the 700 MHz band should be available by the time auction of this band is contemplated.

Q21. Do you agree with the demand side issues discussed in Chapter 5 and Chapter 6? How these issues can be addressed? Please also indicate any other demand side issues which are not covered in the CP.
We agree with all the points made in the CP, additionally we recommend that Incentivise development of Retail Services Provider ecosystem for services like eEducation, eHealth, Video Entertainment etc. to drive adoption

Attractiveness of NOFN enabled services

Propensity to pay[1]

eHealth $2B

Tuitions

Skills Dev

eEdu/ Skills $1B

Produce marketing

Crop related information (price, insurance)

eBanking $0.6B

eAgriculture $1B

Information related to admissions, assignments

eEntertainment $0.4B

Information related to subsidies

Service desirability[1]

SOURCE: CISCO Consulting- IMRB Rural India Survey of over 3000 villages across India, 2013

- The Cisco IMRB survey highlighted that villagers, particularly in less developed states want advanced connected services like remote education tuitions/ remote diagnostics, sale of agri merchandize, etc.
- Villagers have propensity to spend for these services as well, particularly the advanced services, something that is not offered by CSCs today
- Rural India wants more than basic access / information services
- High desirability / willingness to pay for services that open new pathways to learning, health and income generation

Q22. Please give your comments on any related matter, not covered above.

To reduce the broadband bill for the customers, the government should consider exempting broadband / internet packages from the service tax for 5 years. The situation can be reviewed after that.

1. Developing Right Components for Broadband Supply Chain

For faster proliferation of broadband networks, all the important parts of the supply chain including Access, Aggregation (Backhaul), Core and International connectivity must work efficiently.

- Access Networks primarily would include wireless & wired Networks with each technology having its own pro's and cons, but from India point of view 3G/4G/Wi-Fi and FTTH are the ones that are going to be promising.

- Mobile networks can be expanded through densification of sites and integration of WiFi. We expect this to happen in the future. The infrastructure being used is likely to be small or pico cell infrastructure.
- Aggregation/Core Backhaul Network connecting these various Access Networks is key to the success of broadband because no matter how good is the wireless or wired Access networks, ultimately it is as good as the backhaul/aggregation network is.

2. Consider network architecture choices based on network end-users (Retail SP/Consumer and G2G)
   - For Retail SP and consumer users choose integrated E2E NETCO and OPCO BBNL. These users include G2C (including e-Healthcare, eEducation and skills development, e-Agriculture, etc.), B2B and B2C (incl., video, banking, etc.)
   - 2012 Cisco IMRB survey of 3,000 villagers showed that adoption of broadband increases significantly when consumers get high-speed, reliable broadband, with QoS/SLAs. Having an integrated NETCO and OPCO BBNL entity model that ensures these capabilities becomes crucial.
   - Spaghetti models (built by federating/integrating different networks would result in significant complexity and compromise long term sustainability

3. For G2G services (e.g., connectivity to police stations, tax, subsidy to block and Panchayats level) optimize & integrate existing networks of NII, NKN & SWAN with NOFN- that are in any case designed for such uses.