Response to TRAI Consultation Paper on Broadband Connectivity and Speed

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Preliminary

This submission presents a response by individuals working at the Centre for Internet & Society (CIS) to the Telecom Regulatory Authority of India's *Consultation Paper on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed*[1] (hereinafter, the "TRAI Consultation Paper") released on 20 August, 2020 for comments.

CIS appreciates the continual efforts of Telecom Regulatory Authority of India (TRAI) to have consultations, and is grateful for the opportunity to put forth its views and comments.

Responses to issues for consultation

Q1. Should the existing definition of broadband be reviewed? If yes, then what should be the alternate approach to define broadband? Should the definition of broadband be:

a. **Common or separate for fixed and mobile broadband?**
b. **Dependent or independent of speed and/or technology?**
c. **Based on download as well as upload threshold speed, or threshold download speed alone is sufficient?**
d. **Based on actual speed delivered, or on capability of the underlying medium and technology to deliver the defined threshold speed, as is being done presently?**

Please suggest the complete text for revised definition of the broadband along with the threshold download and upload speeds, if required for defining broadband. Kindly provide the reasons and justifications for the same.

Q2. If you believe that the existing definition of broadband should not be reviewed,then also justify your comments.

We need policies that focus on (1) the consistent speed of delivery (2) of reliable internet (3) while mitigating environmental impact.

a. Fixed or mobile is not relevant as long as high-speed internet serves the user.
b. Technology, likewise, is irrelevant provided there is equivalent environmental impact.
c. Both download and upload speeds are important depending on user needs.

[1] "Consultation Paper on Regulatory Framework for Over-The-Top (OTT) Communication Services", Telecom Regulatory Authority of India (2020), <https://trai.gov.in/sites/default/files/Broadband_CP_20082020.pdf>

Q3. Depending on the speed, is there a need to define different categories of broadband? If yes, then kindly suggest the categories along with the reasons and justifications for the same. If no, then also justify your comments.

There are reasons for considering government charges varying inversely with internet delivery, to incentivize higher delivery. This needs to be worked out with stakeholders.

Q4. Is there a need to introduce the speed measurement program in the country? If yes, please elaborate the methodology to be implemented for measuring the speed of a customer's broadband connection. Please reply with respect to fixed line and mobile broadband separately.

Yes, there is a need to introduce a speed measurement program in the country. A simple mobile application that pings and performs a basic speed test at regular intervals to a record register with service providers should be adequate (example: Net Speed Monitor). These records should be reported to the TRAI/be accessible on websites as real-time graphs with tables.

Q5: Whether the Indian Telegraph Right of Way (RoW) Rules 2016 have enabled grant of RoW permissions in time at reasonable prices in a non-discriminatory manner? If not, then please suggest further changes required in the Rules to make them more effective

Q.6: Is there any alternate way to address the issues relating to RoW? If yes, kindly elucidate.

Q7: Whether all the appropriate authorities, as defined under the Rules, have reviewed their own procedures and align them with the Rules? If no, then kindly provide the details of such appropriate authorities.

Q8: Whether the RoW disputes under the Rules are getting resolved objectively and in a time-bound manner? If not, then kindly suggest further changes required in the Rules to make them more effective.

Q9: What could be the most appropriate collaborative institutional mechanism between Centre, States, and Local Bodies for common Rights of Way, standardisation of costs and timelines, and removal of barriers to approvals? Justify your comments with reasoning.

Q10: Should this be a standing coordination-committee at Licensed Service Area (LSA) level to address the common issues relating to RoW permissions? If yes, then what should be the composition and terms of reference of this committee? Justify your comments with reasons.

Q11: Is there a need to develop common ducts along the roads and streets for laying OFC? If yes, then justify your comments.

Q12: How the development of common ducts infrastructure by private sector entities for laying OFC can be encouraged? Justify your comments with reasoning.

Q13: Is there a need to specify particular model for development of common ducts infrastructure or it should be left to the land-owning agencies? Should exclusive rights for the construction of common ducts be considered? Justify your comments with reasoning.
Q14: How to ensure that while compensating the land-owning agencies optimally for RoW permissions, the duct implementing agency does not take advantage of the exclusivity? Justify your comments with reasoning.

Q15: What could be the cross-sector infrastructure development and sharing possibilities in India? Justify your comments with examples.

Q16: Whether voluntary joint trenching or coordinated trenching is feasible in India? If yes, is any policy or regulatory support required for reaping the benefits of voluntary joint trenching and coordinated trenching? Please provide the complete details.

Q17: Is it advisable to lay ducts for OFC networks from coordination, commercial agreement, and maintenance point of view along with any other utility networks being constructed?

Q18: What kind of policy or regulatory support is required to facilitate cross-sector infrastructure sharing? If yes, kindly provide the necessary details.

Q19: In what other ways the existing assets of the broadcasting and power sector could be leveraged to improve connectivity, affordability, and sustainability.

Q20: For efficient market operations, is there a need of e-marketplace supported by GIS platform for sharing, leasing, and trading of Duct space, Dark Fibre, and Mobile Towers? If yes, then who should establish, operate, and maintain the same? Also, provide the details of suitable business model for establishment, operations, and maintenance of the same. If no, then provide the alternate solution for making passive infrastructure market efficient.

Q21: Even though mobile broadband services are easily available and accessible, what could be the probable reasons that approximately 40% of total mobile subscribers do not access data services? Kindly suggest the policy and regulatory measures, which could facilitate increase in mobile broadband penetration.

The appropriate method to determine future steps on these issues is Participatory Action Research[2] by stakeholders, with professional facilitators, and domain experts accessed as required.

[2] Principles of canonical action research, Robert M. Davison, Maris G. Martinsons & Ned Kock (2004), <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.466.190&rep=rep1&type=pdf>

Q22: Even though fixed broadband services are more reliable and capable of delivering higher speeds, why its subscription rate is so poor in India?

Q23: What could be the factors attributable to the slower growth of FTTH subscribers in India? What policy measures should be taken to improve availability and affordability of fixed broadband services? Justify your comments.

Q24: What is holding back Local Cable Operators (LCOs) from providing broadband services? Please suggest the policy and regulatory measures that could facilitate use of existing HFC networks for delivery of fixed broadband services.

The Association for Progressive Communications has identified key aspects of regulation that affect local and small service providers[3]:

- *Operator licensing*: To encourage local operators, India can explore license exemptions for non-profit and community networks.
- *Spectrum licensing and associated fees*: India can incrementally make certain spectrum license exempt, and encourage dynamic spectrum management.
- *Access to Backbone infrastructure*
- *Access to network information*
- *Financial support:* Finally, small companies trying to operate in regions that have been previously unserviced by any internet service provider may need monetary support.

Q25: When many developing countries are using FWA technology for provisioning of fixed broadband, why this technology has not become popular in India? Please suggest the policy and regulatory measures that could facilitate the use of FWA technology for delivery of fixed broadband services in India.

Fixed Wireless Access is essential for effective connectivity in India. As a first supportive policy, India can enabling FWA links that are harmonized to global standards.[4] More specifically, the harmonization needs to be on the lines of the regulations modelled on those of the FCC for 5GHz. This needs to be done for all globally harmonized bands that are feasible in this region, including some not mentioned in the DOT's recommendations,[5] such as the 6GHz band for Wi-Fi.

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[3] The Association for Progressive Communications, "EXPANDING THE TELECOMMUNICATIONS OPERATORS ECOSYSTEMPOLICY AND REGULATORY GUIDELINES TO ENABLE LOCAL OPERATORS", <https://www.apc.org/sites/default/files/APC_R1_ExpandingTelecommunication_OK.pdf>

[4] *See* DOT's Report of the 5G High Level Forum, August 23, 2018, <https://dot.gov.in/sites/default/files/5G%20Steering%20Committee%20report%20v%2026.pdf> pg 27-28, 30.

[5] *Ibid.*

Second, certain bands such as the 60GHz V-band and 70-80GHz E-band need a modification that allows use only by authorized licensed operators, to rationalize for their high government charges for licences and spectrum.

This is a major point of contention between the local operators through COAI, and global technology platforms such as Google, Microsoft, Apple, Facebook, and so on. The latter are in favour of regulations conforming to global norms. The reason for not conforming entirely with global norms to make these bands licence-free and accessible to all users (as in Wi-Fi) is because the network coverage in advanced economies is far more complete than in India. Therefore, it is only the last- or second-last mile hop for which these bands are needed in OECD countries, as they have fairly comprehensive fibre networks except in the rural countryside. In India, any technology giant could build and run a country-wide network if allowed licence-free access to V-band and E-band, by leasing existing fibre from the market. They would do so without having paid for spectrum in auctions, thereby destroying the business case for existing operators who have paid enormous amounts for it.

Third, all microwave links need to be priced minimally, in a manner that incentivizes their use in our networks.

Q26: What could be the probable reasons for slower fixed broadband speeds, which largely depend upon the core networks only? Is it due to the core network design and capacity? Please provide the complete details.

Fixed broadband speeds depend on all the links and components, and not just the core networks. Any bottleneck, including middle-mile and last-mile links and equipment, slows internet delivery. Therefore, enabling policy support is needed for each of these elements, including minimal taxes charged on equipment and usage.

Q30: Is there a need of any policy or regulatory intervention by way of mandating certain checks relating to RAN user plane congestion? What should be such checks? If yes, then suggest the details, including the parameters and their values. If no, then specify the reasons and other ways to increase performance of RANs.

Policies should support maximal RAN sharing using Nordic network sharing principles.

For examples, see:

- “The role of network sharing in transforming the operator business: Impact on profitability and competition”, Molleryd & Markendahl, ITS Conference October 2013.” <https://www.econstor.eu/bitstream/10419/88459/1/774089377.pdf)>
- "Dynamic Spectrum Sharing: It’s Not Just for 4G and 5G", Ed Gubbins, July 2020." <https://networkmatter.com/2020/07/02/dynamic-spectrum-sharing-its-not-just-for-4g-and-5g/>

- "The well-kept secret of 2G-3G-4G-5G Dynamic Spectrum Sharing", Harry Kuosa, Nokia, May 2020. <https://www.nokia.com/blog/the-well-kept-secret-of-2g-3g-4g-5g-dynamic-spectrum-sharing/>
- “Network-Sharing Key To Improved 4G Coverage In Germany”, Fitch Solutions, February 2020. <https://www.fitchsolutions.com/corporates/telecoms-media-technology/network-sharing-key-improved-4g-coverage-germany-18-02-2020>

Q32: Is there a need of any policy or regulatory intervention by way of mandating certain checks relating to consumer devices? If yes, then please suggest such checks. If no, then please state the reasons.

Consumer devices that can harm usage such as jammers and snooping devices should be prohibited, with prohibitive penalties for transgression.

General notes

Basic Deficiencies in Our Approach to Telecom Policy

A fundamental shortcoming in our telecom policies from 1994 to date has been unrealistic expectations of market dynamics. One aspect of this is the expectation that markets have self-organizing capabilities for structures and systems. One example is an apparent assumption that competition will evolve to stable equilibrium, even for this essential infrastructure service, where there is a network effect that tends to a natural monopoly.

In this context, the need for each operator to build out dedicated networks has been truly onerous. An extension of this is the flawed approach to BharatNet, a state-sponsored core network that is expected to somehow lead to the private sector building of access networks at the user level in the vast peri-urban and rural countryside of India, despite the commercial logic being weakened by geographical spread and sparser habitation. This is further exacerbated by having to acquire and pay for spectrum in an underdeveloped (until the 90s) and thereafter developing market, where nearly half the population lives outside urban agglomerations. An additional disincentive in India has been the restrictive policies in spectrum allocation and assignment. As a result, our operators now have between 45-54 MHz each, whereas operators in a country such as Panama have 240 MHz each, and China’s operators have nearly 200 MHz, according to the TRAI Consultation Paper.

Champions of a free-market approach (even in select areas) such as the US and the UK recognized these facts, and integrated the associated commercial compulsions into their policies. In the US, ATT was broken up in the 1980s into regional entities and compelled to share their access networks, and in the UK, British Telecom went through its first transformation to become a facilities provider sharing its network with other local operators.

As the technology and equipment installed globally is similar, the commercial compulsions, too, remain the same. This transformation of shared infrastructure must happen in India for us to aspire to services on par with global developments.

Using Action Research

The following areas need to be considered by stakeholders in time-bound, goal-directed efforts, with professional facilitation to work out requisite policies and practices.

1. *Sharing existing infrastructure – access and core*

   It is unrealistic to expect India to have ubiquitous high-speed internet access without fully shared infrastructure. The capital requirements alone are sufficient to compel this realization. Yet, our policies do not reflect this.

   The methodology too needs to be developed through systematic evaluation and detailed work-outs, as against bureaucratic wish-lists couched as objectives, camouflaged with injunctions and stipulations. For instance, the TRAI Consultation Paper gives anecdotal information on shared infrastructure, whereas what is required is a systematic presentation and evaluation, followed by action-research undertaken by stakeholders, with appropriate expert facilitation, and supported by appropriate authority. As the turf issues span everything from Central ministries (Finance, Communications, I&B, Space, Defence, Home Ministry, Urban Development, Transport, Railways, etc.) to State governments, this requires buy-in and active support from the PM and his cabinet, state CMs and their cabinets, and the other 'pillars' – the judiciary, the print and electronic media, and civil society. Note: "Expert facilitation" means the use of professionally qualified facilitators with a systems background, assisted by access to a panel of domain experts in relevant areas as required, e.g., spectrum and fixed line use in communications technology, shared RANs, shared infrastructure, game theory and practical applications of Shapley Values, financial modelling with probabilistic simulation, telecom regulation law, and so on.

2. *The Public Resources of Spectrum and Land*

   As an adjunct, the misconceived notion of governments 'profiting' from leasing

spectrum and rights-of-way needs to be overturned completely. Instead, considerations of future public benefits from facilitated access to spectrum and public lands, buildings and other facilities should drive the evaluation of alternatives for adoption in the public interest. Government collections will rise as service delivery increases, as evidenced in licence and spectrum charges since NTP-99 and more realistic revenue-share rates since 2004.

3. *Fair Principles of Compensation*

Sharing costs and benefits in the context of Spectrum, Radio Access Networks, and core networks are often viewed as difficult or insurmountable problems, whereas the models for fair cost-and-benefit sharing already exist, as applied to airport facilities and the use of Shapley Values. These principles and their applications, which may seem problematic to most of us who are unfamiliar with the complex computations of shared costs and benefits in collaborative/participative undertakings in the real world, are quite familiar to practitioners in areas such as facilities sharing for airports, and joint-exploration-and-production-sharing contracts for oil and gas, or sale-leaseback of aircraft, ships, terminals and so on. Not everyone can be expected to understand or implement the complex algorithms, but this can be said, for instance, of any linear-programming (or dynamic programming) application in logistics scheduling, such as of aircraft for airlines, or wagons or coaches for trains, or goods to warehouses in a regional or national network.

4. *Government Charges – Pay-for-Use of Resources (After-the-fact, as for Taxes)*

A basic principle applied in most economic activities and government charges is that resources are paid for after their use. There are exceptions, as in rights for mining or oil exploration and production. In communications, the practice (after 1990 from advanced economies that are free-market based, and hence inappropriate templates for developing economies) for franchise licences, spectrum, and rights-of-way, has been of up-front levies. For licence fees, in India, after 1999 this was changed to after-the-fact charges on the basis of a share of revenues. Quite simply, this principle of after-the-fact payment needs to be applied to all charges to do with activities related to essential infrastructure, to ensure development and availability. As it happens, government revenues were actually maximized in the case of licence fees after 2004,[6] and the application of similar principles to spectrum and rights-of-way are likely to yield much higher government collections.

[6] *See* Shyam Ponappa, "Save Telecom With A Reprise Of NTP-99", Organising India (January 3, 2020), <https://organizing-india.blogspot.com/2020/01/save-telecom-with-reprise-of-ntp-99.html>