Ref: STL/2020/CP/TRAI/001

12th October 2020

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Chairman,
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Sub: Submission towards inputs invited on the Consultation Paper on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed'.

Respected Sir,

In the response to the inputs invited from various stakeholders on the Consultation Paper regarding **Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed,** as issued by TRAI on 20th August 2020**,** please find enclosed our submission for your kind perusal and consideration.

We are hopeful that the relevance of the vital inputs shared by us shall be deliberated upon in detail, in the process of culminating a recommendation regarding this critical issue for the industry.

With regards,

Yours sincerely,

Bharat Gupta,
Head - Corporate Affairs,
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STL Response to TRAI Consultation Paper

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.

Q.3: 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.

Ans: Yes, the existing definition of broadband should be reviewed. There is also a need to define different categories of broadband

1. Definition of Broadband (512 Kbps) was promulgated by DoT on 18 July 2013. In 2016 TRAI had recommended that the definition of broadband needs to be reviewed and the minimum download speed needs to be enhanced to 2Mbps. As per NDCP-2018, every citizen must be provided with 50 Mbps broadband connectivity. It is well established that Mobile, FWA and Fixed Broadband have different technologies, mode of delivery, speed, QoS parameters and cost, hence a uniform definition for all the modes of broadband is not recommended.

2. The speeds should ideally be defined basis capability, technology and medium of delivery.

3. Suggested categories of broadband are:
(a) Mobile Broadband: 50-75 Mbps
(b) Fixed Wireless Access: 75-100 Mbps
(c) Fixed Broadband: >100 Mbps

Reason:

(a) Channel characteristics and SNR (Signal to noise ratio) vary when the medium of transmission/reception in air, duct etc. Data rates are dependent upon channel characteristics as has been proved by the Shannon capacity theorem. It has also been proved that the Shannon limit can be breached if innovative technologies like MIMO and beam forming antenna are used in communication systems. Hence using the same baseline speed for all the medium (Wireline and Wireless) would result in comparing two different entities who have characteristics.

(b) Based on the offered speed, stringent QoS monitoring parameters can be imposed for the benefit of customers who pay differential prices based on the category of services, data speeds, data volume and latency.

(c) Availability of different flavours of broadband at different price-points would help in better penetration and availability of broadband services in Rural as well as Urban areas.

(d) Incentives would exists in each category to perform better than the peers which would ultimately result in better services to the users, aggressive business models, early adoption of new technologies by service providers, better revenue generation and sustainable ARPU(Average Revenue Per User).

Q.2: If you believe that the existing definition of broadband should not be reviewed, then also justify your comments.

Ans: Please refer response to Q.1.

Q.4: 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.

Ans:

1. Yes, there is a need for speed measurement framework in the Country. As such, DoT has its presence in each LSA with a mandate to ensure adherence to License conditions by the Licensees. TRAI also regularly conducts speed tests and monitoring of QoS parameters, the same are then made available on the TRAI portal. It would be prudent to formulate a similar framework for monitoring the broadband speeds.

2. NDCP-2018, has proposed to establish NFAI as well as National Fiber Grid for real-time monitoring of fiber deployment and optimal utilisation of fiber resources in the country. It is therefore recommended that TRAI be mandated to independently undertake broadband speed measurements in the country and the findings be populated on the TRAI portal as well as the National Fiber Grid Portal.

Q.26: 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.

Ans: Some of the probable reasons for the fixed broadband speed are as follows:

(a) Lack of Standards and guidelines for OFC and OFC deployment.

(b) Legacy equipment's and technologies deployed for delivering broadband services.

(c) Frequent cuts and disruptions due to natural and manmade reasons. Cuts can be attributed to lack of planning and implementation for utilities like Power, Roads, Water, Gas and OFC at the design and implementation stages. Due to lack of standards, OFC connectivity gets disrupted due to termites, seepage etc, these can be mitigated through promulgation and implementation of ducting and OFC standards.

(d) Core capacity and design parameters contribute to the slow broadband speeds. The Core NW should be able to support the aggregated requirement at the Access NW. Since the access layer must accommodate growing number of consumers, data rates, type of applications and services etc, the Core NW must be scalable, agile and robust to support the Access layer.

RoW:

Q.5: 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.

Q.7: 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.

Q.8: 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

Ans:

1. OFC is the primary medium for backhaul/ Core connectivity. Indian optical fiber cables (OFC) market stood at $ 881.5 million in 2019 and is projected to grow at a CAGR of 19.7% to reach $ 2.1 billion by2024. Telecommunication has been identified as the Critical Information Infrastructure by NCIIPC, however, it is yet to be classified as an important and critical utility akin to Roads, Power, Gas, Water etc. Although, Right of Way Rules 2016 was a path breaking initiative by the Government, but it has only been able to achieve partial results even after four years.

2. Only 16 out of the 37 states/Union Territories in India have aligned with the RoW (Right of Way) Rules, 2016, issued by the DoT. This is jeopardising the rolling out of telecom infrastructure in the country. One of the primary reasons for slow adoption is because, the Local Bodies, State Governments etc view allocation of ROW as revenue generating machine at the behest of being the state subject.

3. Non-uniform ROW charges make it commercially unviable for the IP-1 licensees, TSPs to undertake the exercise of rolling out of fiber. In case of National Highways, NHAI has evolved a NHCCI(National Highway Construction Cost Index) which clearly states the associated costs for development of highways; this, brings in clarity to all the potential bidders and infrastructure developers in working out the project costs.

4. In view of the foregoing, STL recommends following:

- **(a)** ROW rules need to be revised based on lessons of past four years.
- **(b)** Create a FDCI (Fiber Deployment Cost Index) akin to NHCCI.
- **(c)** Fiber Connectivity be identified and declared as a public utility.
- **(d)** ROW be made a Centre subject and not a state subject, alternatively remove the ROW charges or declare a uniform subsidised ROW charges for a period of next five to ten years.
- **(e)** NFAI and National Fiber Grid be created at the earliest as per NDCP-2018.

Q.9: What could be the most appropriate collaborative institutional mechanism between Centre, States, and Local Bodies for common Rights of Way, standardization of costs and timelines, and removal of barriers to approvals? Justify your comments with reasoning. 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.

Ans: Over and above the recommendations made for Q.5 to Q.8, following additional points may be considered:

1. The current process of RoW approval requires multiple approvals from different agencies and level making it operationally challenging and financially unviable. National Broadband Mission has suggested three layers of monitoring and decision making in the Mission Document. While most of the stakeholders have been mapped in these committees, at the execution level voids exists. At the state level, State Broadband Committee is made responsible for addressing issues related to Broadband proliferation. Broadband committee at the District/City/Ward/Village level do not exist, also, the Mission Directorate is neither empowered nor staffed to undertake day to day issues related to impediments in roll-out of fiber in an area. In view of the foregoing, there is a need for creating framework and accountability structure at the District, City, Ward, Village levels. Also, the necessary to establish the NFAI and the Fiber grid is urgent and inescapable.
2. Basis gaps in fiber connectivity seen on Fiber grid, the Local Govts should be held accountable for providing ROW clearances on priority through a single window.
3. Need for FDCI (Fiber Deployment Cost Index) has already been brought out in response to Q.5 above.

Q.10: 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.

Ans: Please refer to our response for Q.9 above.

Common Duct:

Q.11: Is there a need to develop common ducts along the roads and streets for laying OFC? If yes, then justify your comments.

Ans: Yes, there is a need to have a Common Duct Policy on the lines of Ministry of Roads Transport and Highways. In 2017, a proposal to this effect was forwarded by DoT to Ministry of Rural Development, as well as the Ministry of Road Transport and Highways, however not much traction has been achieved. Simultaneously a pilot project for implementing common duct was undertaken by TRAI in Jharkhand. TAIPA had also in the past has proposed for a common duct for speedy rollout of towers. Importance and the outcome of having Common Ducts have been elucidated in the Consultation Paper and we agree with the anticipated benefits.

Q.12: How the development of common ducts infrastructure by private sector entities for laying OFC can be encouraged? Justify your comments with reasoning.

Q.13: Is there a need to specify model for development of common ducts infrastructure or it should be left to the landowning agencies? Should exclusive rights for the construction of common ducts be considered? Justify your comments with reasoning.

Q.14: 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.

Q.15: What could be the cross-sector infrastructure development and sharing possibilities in India? Justify your comments with examples.

Q.16: 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.

Q.17: 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?

Q.18: What kind of policy or regulatory support is required to facilitate cross-sector infrastructure sharing? If yes, kindly provide the necessary details.

Ans:

1. Recommendations for enhancing the scope of IP-1 is already under active consideration at DoT as well as TRAI. However, following two models may be adopted for development of common ducts:
   (a) Model # 1: Land owning agencies themselves can develop common ducts which they can lease to service provider on commercial terms. National Highway Authority of India can develop such models.
   (b) Model # 2: Alternatively, the land-owning agency can grant one-time, long term RoW to a utility company, and the utility company can develop and maintain the common ducts infrastructure. In lieu of the RoW permission, the land-owning agency can either charge one-time fee from the utility company intending to develop common ducts infrastructure or enter a public-private partnership arrangement with the developer of common ducts infrastructure.
2. Need for enhancing Government spending in development in telecom infrastructure:
   Post 1990's, the Government spending in the telecom infrastructure development has reduced substantially and it has been left to the TSPs/ISPs, IP-1 companies to develop necessary telecom infrastructure. This, incidentally, has created a massive digital divide between the urban and rural areas. TSPs find it economically unviable for expanding their networks in rural areas/ backward pockets in urban areas, the current economic health of the industry has very limited scope for deployment of additional capital for Telecom Infra development. In view of the foregoing, following in recommended:
   (a) Existing guidelines for utilisation of USOF fund needs to be revised basis present impediments to include backward urban areas also.
   (b) Emphasis be given by Govt on Service delivery rather than fiscal benefits when it comes to infrastructure development.
   (c) Govt to increase its spending and ownership in development of fiber network in the country through direct participation, PSUs, Extra Budgetary Support, Non-Lapsable dedicated budget support, promoting local telecom equipment and fiber manufacturers through fiscal and policy support.

Innovative Business Models:

Q.19: In what other ways the existing assets of the broadcasting and power sector could be leveraged to improve connectivity, affordability, and sustainability.

Ans: Broadcasting sector through the LCOs and the MSOs have a formidable connectivity reaching each household in the country, similarly, the power sector too has reach at the remotest corner of the country. The reach and availability of existing infrastructure of broadcasting and power can be gainfully utilised for proliferation of broadband connectivity. Deployment of core backbone network using high capacity fibers using

powerlines and pylons can be a viable model, this would result in massive cost saving in terms of Row as well as repairs and maintenance. Networks of LCOs and MSOs can be utilised at the access layer. Amalgamation of the Power Infrastructure available on "Tarang" and Fiber Grid can be carried out subsequently.

Q.20: 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.

Ans:

1. Yes-there is apparently a need of an e-marketplace supported by a GIS platform to help facilitate sharing leasing & trading of passive infra. There are approximately 900 IPs-I, and 1600 TSPs, ISPs and 60,000 LCOs operating in India, majority of them have either laid or leased OFC infrastructure for delivery of various services. Inspite of this, there is a large deficit in the fibrisation in our country, as per KPMG report there is a need for laying approximately 450 MFKm in next five years to achieve the targets set out by NDCP-2018.
2. Availability of infrastructure like the OFC and passive components is a major impediment in proliferation of broadband in the country, moreover, Govt spending in development of telecom infrastructure/fibrisation has been declining over the years. In view of the foregoing, involvement on Govt by providing fiscal, policy support, ease of doing business, promoting local telecom industry and encouraging FDI has become critical.
3. Trading of passive telecom infrastructure in the form of leasing, sharing and trading of Duct space, Dark Fibre, and Mobile Towers would be worth considering on a pilot mode before releasing a full policy. The pilot project can be undertaken by TRAI and if found feasible can be replicated in the country. Blueprint of this platform and other modalities can be undertaken separately through an active consultation with the industry and other stakeholders.

Q.24: 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.

Ans:-

Reasons for Low Penetration, Slow Speeds:

Q.21: 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.

Ans: To increase mobile broadband connectivity following actions may be considered:

1. Undertaking massive fibrisation and de-risking the connectivity by deploying minimum 96 fiber cables.
2. Increase fibrisation of towers for long term benefits.
3. Build local device ecosystem to bring down the cost of end user mobile devices.
4. Offload TSP data on WiFi NWs to create additional capacities.
5. Enacting data privacy laws that support the privacy of telecom subscribers and protects them from cybercrimes, this would help in higher people participation in digital payments and social media interactions.

6. India, being a vast country with multiple languages, customs and traditions; a multilingual campaign may be undertaken by DoT in partnership with TSPs to create awareness about the benefits of mobile broadband in remote areas.

Q.22: Even though fixed broadband services are more reliable and capable of delivering higher speeds, why its subscription rate is so poor in India?

Ans: While Urban areas have a substantial presence of fixed broadband thanks to Home and Industrial IoT applications, high data consumptions, need for low latency application etc, it is the rural areas where low fixed broadband penetration has been seen. Some of the reasons for low penetration of fixed broadband are as follows:

1. Low fiber penetration, higher costs of fiber deployment.
2. Lack of Govt spending in creating rural digital infrastructure.
3. Mobility and ease of using mobile broadband.
4. Low throughput and coverage area of WiFi equipment in last mile connectivity.
5. Erratic/limited availability of electricity power.
6. Lack of awareness and availability of products and services.
7. Presently, 22 % of mobile towers in India are connected on optical fibre cables, unlike China, where as much as 80% of its mobile towers are fiberised[1].
8. Despite significant investments, India's per capita fibre coverage stands at meagre 0.09 fibre km as against the 0.87 fibre km for China and 1.3 fibre km for Japan and the US[2]. Therefore, there is a need for policies to promote big investments in fixed infrastructure.

Q.23: 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.

Ans: Please refer to the answer to Q.22 above

Q.25: 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.

Ans: FWA (Fixed Wireless Access) and Fixed Broadband are two different technologies. While the FWA utilises spectrum to connect Home/Office base station to the nearest mobile tower, the Fixed broadband router at the Home/Office is connected directly by the OFC. In view of the foregoing, following steps may be considered for the proliferation of FWA and fixed broadband separately:

1. **FWA:**
   - **(a)** Availability of spectrum in the E band/V Band.
   - **(b)** Standardisation and protocols to address issues of interference and congestion.
   - **(c)** Create domestic device ecosystem.
   - **(d)** Allowing bulk encryption of the entire bandwidth for privacy and security, presently connecting of BEUs is not permitted under license conditions.
   - **(e)** Standardisation of tariffs.
2. **Fixed Broadband:** Steps to be taken have been mentioned as response to Q.22

[1] https://telecom.economictimes.indiatimes.com/news/current-telecom-infrastructure-growth-rate-may-play-spoilsport-to-indias-5g-party/69596900

[2] https://www.communicationstoday.co.in/realising-the-broadband-dream/#:~:text=Despite%20significant%20investments%2C%20India's%20per,for%20Japan%20and%20the%20US.

Q.29: What could be the probable reasons for slower mobile broadband speeds in India, especially when the underlying technology and equipment being used for mobile networks are similar across the world? Is it due to the RAN design and capacity? Please provide the complete details.

Ans: Some of the reasons for slow mobile speeds in India are as follows:

(a) Limited Spectrum availability.
(b) Largest number of users/Mhz of spectrum leading to optimal utilisation and not peak utilisation. Higher Contention Ratio.
(c) Higher data consumption, approximately 16.7 GB per user/month.
(d) Lower capital investments in upgradation of legacy networks.
(e) Backhaul challenges: Most of our Backhaul is based on low capacity MW networks. Fibre reaches to barely 22% of our Towers, unlike other countries like China, where Fibre reaches close to 80-90% of the Towers.

Q.30: 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.

Q.31: Should it be mandated to TSPs to declare actual congestion, average across the LSA, recorded during the previous month over the air interface (e.g., LTE Uu), in the radio nodes (e.g., eNB) and/or over the backhaul interfaces between RAN and CN (e.g., S1-u), while reaching out to or enrolling a new customer? If so, then suggest some parameters which can objectively determine such congestions. If no, then specify the reasons and other ways to increase performance of the RAN.

Q.32: 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.

Q.33: To improve the consumer experience, should minimum standards for consumer devices available in the open market be specified? Will any such policy or regulatory intervention

Questions 30-33 are pertaining to TSPs/Device Manufacturers, hence not responded by STL.