To **09-11-2020**

Shri Sunil Kumar Singhal,
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Sub: Tata Communication Limited's response to TRAI Consultation Paper on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed'

Ref.: Consultation Paper dated 20th August 2020 issued by TRAI

Dear Sir,

This is with reference to consultation paper **on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed'** issued by TRAI on 20th August 2020; please find annexed detailed comments on behalf of Tata Communications Ltd. on various issues raised in the said consultation paper for your perusal and kind consideration. The said annexure is marked as **Annexure A.**

Thanking You,

Yours Sincerely,

For Tata Communications Ltd.

DocuSigned by:
Praveen Sharma
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(Praveen Sharma)
Authorized Signatory

ANNEXURE A

Response By

Tata Communications Limited to the Consultation Paper issued by TRAI On

"Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed"

Preamble

At the outset, we would like to thank TRAI for providing us an opportunity to provide our comments on this very important issue put up for public consultation. We believe the issues presented are critical for the digital transformation of India.

It is well-known fact that the broadband service is an essential element of growth for the country and one of the key contributors in India's GDP. Clearly, broadband services are the platforms through which the Government's vision of 'Digital India' can be achieved and crucial services such as m-banking, m-health, m-education would be delivered to the common man. In order to achieve this ambitious objective, reliable and high-speed broadband connectivity is an essential and basic requirement. Further, increasing availability and use of broadband services have both economic and social benefits. Moreover, broadband services have played an instrumental role in this difficult time of COVID-19 pandemic and have immensely benefitted the populace of India.

The reliable connectivity and high speed are two vital elements for the broadband services. The NDCP-2018 has also stated two strategic objectives with respect to broadband – providing broadband connectivity at 50 Mbps to every citizen by 2022, and to propel India to the top 50 nations in the ICT Development Index of ITU from 134 in 2017.

In order to achieve these strategic objectives, the Government has taken several steps to make the policy environment more conducive for attracting greater investments. TRAI has also issued several recommendations for the proliferation of broadband services in India. One key recommendation dated 29 August 2014 is on liberalizing the allocation and usage of the high capacity E-band and V-band spectrum to increase penetration and speeds of broadband services in India. TRAI has recommended that these bands should be opened with 'light-touch regulation'; and for backhaul purpose, allotment should be on a 'link-to-link' basis at a nominal fee. However, these recommendations are still under the review by DoT. Similarly, there are other important recommendations made by TRAI on the broadband services especially wireless broadband services.

We request TRAI to kindly engage with DoT so that the review of the recommendations, given by TRAI, on broadband services can be acted upon at the earliest.

Q.1: 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.**

Response: We recommend maintaining the existing definition of broadband. No change in the prevailing definition of broadband is recommended in terms of speed as well as the core principles defining the broadband.

Many countries still follow the definition of broadband provided by OECD which considers the threshold download speed for broadband as 256 Kbps. Further multilateral international institutions such as ITU and World Bank seek the data relating to broadband connections with speeds from 256 kbps onwards. One of the key objectives of NDCP-2018 is “Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017.

Increasing the threshold of broadband speed, as well as changes in other principles making the definition of broadband more stringent and/or more narrow by definition, will result in under reporting actual broadband growth in India and thus impacting perception about India’s broadband penetration as well as India’s ranking in the ICT Development Index of ITU.

In reality, it is not the definition of broadband nor threshold parameters under the definition (such as download speed and/or principles covered under the definition) that are detrimental to the growth of broadband in India. Instead, there are many other critical issues around the lack of key underlying infrastructure which are required to addressed by enacting enabling policy measures for the roll out of critical broadband infrastructure and penetration thereof.

Further, besides the currently defined download speed limit under the definition of broadband in India, various ISPs, TSP, MNOs are offering many basic and high speed broadband plans based upon affordability and availability of underlying technology and its capabilities, user needs (taking into consideration the technical needs of the user as well as affordability/commercial needs) and flexibility required by the users. Users have freedom to choose various plans from many Service Providers which are competing with each other for market share.

Thus, the central focus of broadband policy framework must be to address the critical issues plaguing the Telecom and broadband industry that will help to increase the roll out of critical broadband infrastructure and speed of roll out and reduce the cost of maintaining the critical infrastructure and network.

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

Response: Please refer to our response to Question No.1.

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.

Response: No, there is no need to define different categories of broadband based on the speed. The prevailing definition of broadband and thresholds defined under it, are a good broad measure of defining broadband which provides flexibility to various Service Providers to provide broadband Services based upon various technologies e.g. Fixed Wire Line broadband (OFC, Cable, DSL/ADSL etc), Fixed Wireless Access Broadband (LTE-A, etc), Mobile broadband (4G etc).

Further, the technology agnostic definition provides the flexibilities to Service Providers to roll out and provide broadband services in an optimal way based upon the technology availability, design and technical constraints, financial viability and flexibility for innovation both from technology perspective as well as features, plans, pricing options that can be offered.

The technologies keep on evolving to deliver faster broadband speeds to users. The penetration and availability of the advanced technologies to users is determined by how Service Providers are incentivized to bring in and roll out the required technology and infrastructure in a cost effective and agile way. Thus, the core focus should be on policy measures that help to improve the telecom and broadband infrastructure

Service Providers have been submitting the subscriber information to Authority based on technology, speeds etc from time-to-time on a regular basis. Authority can use such reports/data for tracking and measuring effectiveness of various national policy measures, tracking and publishing various performance indicators and provide reports to various international institutions (ITU, World Bank etc.).

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.

Response: There is no need to introduce the speed measurement program in the country. Service providers already have several in-house mechanisms to measure and

track the speed of broadband connections. Further, there are many independent third-party speed measurement tools available in the market for fixed line as well as mobile broadband connections. Besides these, TRAI also conducts speed tests from time to time to check the compliance of Quality of Service parameters. Introducing a single national level speed measurement program to cover various services is not practically feasible. At the same time the independence and effectiveness of such measurements is questionable. We believe that it will be an additional financial burden on the sector without bringing any additional benefits.

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.

Response: The RoW permissions are granted by individual central, state, local government bodies. Telecom sector doesn't enjoy the same privileges which are enjoyed by other Utility providers, such as., Power companies, gas companies etc., enjoy. ROW is an important element and key enabler for digital mission of the Government of India. Current RoW policy is not implemented on the ground as per RoW policy conflict between State and Central Government agency.

Here are some issues that require simplification:

- The RoW charges levied by various central, state and municipal bodies vary from state-to-state, city-to-city and there is no central body that administers or regulates the charging methodology levied by different agencies from time to time. Having one would help in simplification and expediting RoW approvals. Most metro cities have sky-rocketing RoW and reinstatement charges that prohibit laying and developing a fibre network. These charges aren't standard and can vary even within city limits for certain cities.
- There are no SLAs by utility providers for Grant and dispensation of RoW applications expeditiously; standardization in duration (numberof years) for which the RoW permissions are provided, privileges of Service Providers towards reinstatement of fibre assets during the RoW period.
- There are also no statutes or laws that provide protection of fibre assets of Telecom Service Providers which get damaged and cut by various other agencies including Utility providers while they dig to lay their own underground assets like water pipes, drainage systems , electric cables etc. during their own expansion plans. There needs to be guidelines towards safety of assets and remedies thereof that are laid and acquired after payment of huge RoW charges.
- There are also frequent cases where RoW are demanded again for performing repairs or replacement of fibre cables damaged due to fibre cuts caused as above, where regulation and monitoring body would help streamline provision of rights and privileges.

- State and Municipal bodies treat RoW as a “cash cow” by local bodies and state governments on the assumption of being the State subject.
- Government should create an online platform for Railway RoW Applications and with affordable RoW rate because current Railway RoW charges are very high.
- Land demarcation data base in not available with Government and it is creating issues during RoW applications (like Railway, Forest, NHAI etc.).
- Government should establish a Nodal agency like term cell to coordinate and resolve RoW permission issues.
- A single window clearance is a must for processing of all RoW permission applications within 30 days by leveraging digital means to bring transparency and predictability.
- Government should set up central or state level agencies to monitor the success of the RoW policy, and report disputes in implementing the policies.
- Nodal agency should ensure that service providers do not face any problems/ hurdles in obtaining a “No Objection Certificate” (NOC) from various agencies.

In short, the Indian Telegraph Act falls short of the Objective to administer an effective country-vide system that allows Service Providers to build and safeguard Fibre networks in the country and addressing above aspects would help solve these issues in a great way.

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

Response: While the Indian Telegraph Act lays the Statute, there is a need to have a “RoW Policy” administered through the “Department of Telecommunication” and “Information Technology” ministries across central and state bodies that lays a top-down mechanism for various central and state bodies to levy RoW charges, dispense the RoW applications and safeguard privileges of Service Provider during the validity of RoW license.

To enable rapid expansion of broadband, a proper framework needs to be put in place, for allowing structured pole based Aerial fiber deployments, usage of Utility/Electricity/City Lighting Provider Poles which are as resilient as the underground fiber networks in geographies where building underground fiber ducts is a challenge.

There are also additional aspects to address the issues relating to RoW which may be explored:

- Government should propose a structured cable installation approach like electricity pole.
- Free Space Optics (FSO) technology should be used as an alternative to fibre for point to point connectivity. Free Space Optics (FSO) communications, also called Optical Wireless (OW) or Infrared Laser, refers to the transmission of modulated visible or infrared (IR) beams through the atmosphere to obtain optical communications. Like fibre, Free Space Optics (FSO) uses lasers to transmit data, but instead of enclosing the data stream in a glass fibre, it is transmitted through

the air. Free Space Optics (FSO) works on the same basic principle as Infrared television remote controls, wireless keyboards or IRDA ports on laptops or cellular phones.

Free Space Optics (FSO) transmits invisible, eye-safe light beams from one "telescope" to another using low power infrared lasers in the terahertz spectrum. The beams of light in Free Space Optics (FSO) systems are transmitted by laser light focused on highly sensitive photon detector receivers. These receivers are telescopic lenses able to collect the photon stream and transmit digital data containing a mix of Internet messages, video images, radio signals or computer files. Commercially available systems offer capacities in the range of 100 Mbps to 2.5 Gbps, and demonstration systems report data rates as high as 160 Gbps.

Free Space Optics (FSO) systems can function over distances of several kilometres. If there is a clear line of sight between the source and the destination, and enough transmitter power, Free Space Optics (FSO) communication is possible.

Unlike radio and microwave systems, Free Space Optics (FSO) is an optical technology and no spectrum licensing or frequency coordination with other users is required, interference from or to other systems or equipment is not a concern, and the point-to-point laser signal is extremely difficult to intercept, and therefore secure. Data rates comparable to optical fibre transmission can be carried by Free Space Optics (FSO) systems with very low error rates, while the extremely narrow laser beam widths ensure that there is almost no practical limit to the number of separate Free Space Optics (FSO) links that can be installed in a given location.

- There needs to be a framework put in place for allowing structured pole based Aerial fiber deployments which are as resilient as the buried fiber networks in geographies where building underground fiber ducts are a challenge. In fact, Atria Convergence Pvt. Ltd. has implemented a structured pole model in the city of Hyderabad to lay the fiber cable (Length-approx. 12,000 km) for its broadband network rollout. Such kind of optical fiber laying models need to be leveraged in other cities too.

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.

Response: As submitted above, there is a need for a standard ROW Policy that guides RoW charging mechanism/rates and SLAs for dispensation of RoW applications across central and state bodies. Every authority, government body, state municipality has its own charging mechanism while none seem to have a timeframe for dispensation of RoW, or privileges granted to Service Providers during the duration of RoW permission period. The Law falls short of recommended procedures and rules and an adequate Policy in this regard can address the different variations in policies followed by different bodies, to administer a standard aligned guideline.

- Limited number of states have implemented the Government RoW policy on ground, which is jeopardising the rolling out of telecom infrastructure including the

towers, laying fibre cable in those states which ultimately affects the quality of telecom infrastructure

- Key central Government bodies are missing in RoW policy (like Gas pipeline network, Railway, Costal area road).

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.

Response:

- Service Providers today are ill-equipped to experience a fair dispute resolution as the laws do not bring any obligation on part of RoW issuing agencies nor grant any protection to Service Providers for their respective assets. In order to entrust an environment that provides objective, fair and timebound resolution of disputes, we believe there is a need for single fair "Policy" applicable and administered countrywide within ambit of the law. Additional observations and suggestions are -RoW rules are not fully implemented in most of states where in each States and Union Territories are following their own RoW policies.
- Nodal agency could ensure that Service Providers do not face any problems/ hurdles in obtaining a "No Objection Certificate" (NOC) from various bodies (PWD, NMMC, Railway, local wards, Gas authority, electricity, etc.).
- We recommend that RoW permissions should be granted within 30 days to start the activity of laying fiber
- RoW permission granted should also cover work permission for fibre cable maintenance activities.

Q.9: 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.

Response: Government should formulate Governance mechanism to resolve RoW at LSA level and monitor the progress by publishing status of RoW applications.

RoW portal should have transparent view of approval stages, which will provide better control to minimize the TAT.

Government should setup the governing body to resolve all RoW issue within 30 days.

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.**

Response: We strongly agree that a standing coordination-committee at LSA should be formed to address the common issues relating to RoW permissions. Such committee at LSA level should have senior representatives from concerned TERM Cell/LSA office, Secretary level official from Department of Information and Technology, Department of Urban and Rural Development, representatives from telecom companies/infrastructure providers, representatives from respective local authority/municipal corporation on a case to case basis.

Terms of Reference: To review the working of district level committees as stated in our response of question no.9 in time bound manner.

Meeting of this committee should be convened monthly.

All such RoW issues, wherein the work is not limited to one district and is being undertaken in the entire LSA, then any RoW issues arising in such project should be directly brought into the attention of this committee and appropriate resolution should be provided in a time bound manner.

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

Response: Yes, it is recommended to jointly develop common ducts along roads and streets for laying OFC. This will help result in substantial savings for Capex and Opex for the Service Providers. Additionally, it will help in resolving the current RoW issues that are faced by each service provider and will result in reduction of multiple RoW requests for the same common segment.

Establishment of common service ducts and utility corridors will resolve RoW issues up to a large extent and will also be helpful for the telecom companies/infrastructure provider in saving CAPEX and OPEX. However, it needs to be ensured that the access to such common ducts should be provided to all the telecom companies/other utility providers on a non-discriminatory basis to meet their requirements. Further, there has to be a clear policy/procedure from the state Govt./local authority to lay common ducts infrastructure. The cost for accessing such common duct should be reasonable considering the telecom services being an essential service.

Whenever Central or State Governments undertake any major expansion, they need to develop telecom corridor along the National/State highway in consortium model (of interested TSP/IP-1) for better governance.

Government should formulate a committee under Government's Smart Cities project for developing shared telecom infrastructure.

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

Response: The development of common ducts infrastructure would not only enable faster deployment and reach of fiber infrastructure in the country, but would also enable various Service Providers to avail of infrastructure at much lower costs resulting in more efficient use of collective capex across service providers for reaching out to a much larger geography with the same collective funds.

We are of the view that private sector entities can act as a partner with State Government in the speedy deployment of digital communication infrastructure and proliferation of broadband in the State. We recommend that the Private sector entities should be encouraged to develop common ducts infrastructure especially in metro cities like Bangalore, Mumbai, Pune, Hyderabad, and Kolkata, etc.

For this purpose, State Government/local authorities should publish clear policies or procedures and there must be a certainty in the terms of the contract. Selection of the private entities should be done through RFP and linked to Eligibility Conditions to ensure entry of Serious Players only as is being done in case of development of Smart City projects. This will enable participation of private sector entities to lay common ducts infrastructure.

Private players should be encouraged by waiving off charges in lieu of sharing of duct with the Government bodies.

Q.13: Is there a need to specify particular 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.

Response: We recommend consortium model of interested TSP/IP-1 for laying of common duct.

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.

Response: We recommend CapEx/ OpEx sharing model for laying the common ducts and selected entity should get exclusive rights to build, own, operate the same .The selected entity should pay as per Government decided subsidized RoW rate as per MoU with Govt bodies. No Bank Guarantee/ security deposit should be demanded by Local bodies / State Government and unconditional RoW permission on priority should be accorded for laying common duct. Further, another important point to be considered that

route for common duct would be demand driven and subsequent users of the fibre duct would be mandated to plan fibre routes as per existing and available duct routes.

Example: BBMP has developed Tendersure roads in Bangalore, where they are providing the duct space with nominal charge to pull the cable and similar kind of facility developed by Nagpur smart city and Pune (PMC) area.

Private TSP should be mandated to follow the same model like BBMP/Smart cities guidelines as above and should be asked to share the infrastructure i.e. duct space with other TSPs on reasonable market rates.

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

Response: Cross-sector infrastructure development is very crucial for creating a robust telecom infrastructure. There is an opportunity for strong partnership across the Power Distribution Sector – Transmission Line network, Gas utility pipelines, as well as with public works departments – Civil Road and Highways department for creating dedicated telecom passive infrastructure with new Highways and Roads been created. Likewise, there could be synergies created with the Railways for laying of telecom fiber network along Railway and Metro infrastructure.

Government town planning division should plan and earmark various utilities (like GAS, Water, Electricity, Fiber cable) during planning stage of cities road/markets and also keep digital records and update them on a real time basis. These digital records should be made accessible to all stakeholders.

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.**

Response: Currently, there is no policy for voluntary and shared trenching. In our opinion, Government bodies should encourage common trenching by concurrent publishing of the open RoW allocated permission for utilization by telecom service provider/IP-1. This would help the TSPs in sharing the cost of trenching as well as RoW cost.

From maintenance perspective, there should be a city-based portal for advance reporting and coordinating of trenching activities by all the Civic Authorities so that TSPs can act for protecting their assets from damage during such trenching activity.

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?**

Response: Yes, while laying the ducts for OFC Networks, same should be designed to accommodate micro-ducts for other utilities, provided that complete isolation and long-term safety is ensured.

For coordination, commercial agreement, and maintenance point of view, it is suggested to appoint nodal office by each utility service provider. This will facilitate faster rollout and seamless services to all the utility service providers

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

Response: To enable a proper regulatory and industry environment, several steps will be required to be taken by respective stakeholders to facilitate cross- sector infrastructure sharing. The common business models adopted by infrastructure owners for cross-sector infrastructure sharing take many forms and can be designed around the unique circumstances Cross-Sector Infrastructure policymakers and other stakeholders can facilitate greater information exchange and dialogue to raise awareness of cross-sector infrastructure sharing opportunities and points of entry into state-owned infrastructure..

Our suggestions in this regard are:

- Accord Telecom Optic Fibre cables the status of Public utility.
- Construct utility corridors on new roads and highways so that all utilities (including gas, water, and Fiber) are laid together leading to the reduced effort, time and cost of RoW. Adoption of common duct policy would be the right step in this direction.
- Foster partnerships with public sector units to lay fiber cable in their existing utility corridors, speeding up the overall execution, as PSUs already have RoW clearances and fresh digging is not required in this case.
- Encourage Infrastructure providers (NBCC, NHAI, etc.) to partner with or right to lay Fiber at pre-specified rates ducts or trenches.
- Promote collaboration models involving state, local bodies and private sector for the common duct infrastructure in municipalities, rural areas and national highways and same should be available for sharing with all on non-discriminatory basis.

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

Response: We suggest leveraging existing assets of the broadcasting and power sector to improve connectivity, affordability, and sustainability. Some of the suggestions are:

- The Government should provide conducive policy and regulatory environment for using the existing assets of Power and broadcasting sector by telecom sector.
- There should be a tariff framework for sharing such assets.

Q.20: **For efficient market operations, is there a need of 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.

Response: Today, there is no single e-marketplace present for passive infrastructure sharing despite the fact all passive infrastructure sales takes place between the various service providers. While an e-marketplace could help assist create a platform for sharing of passive infrastructure amongst the various participants, the efficacy of the same would be a function of adoption of the said platform by various service providers and ISPs. To begin with, the e-market can start with listing all Government and PSU owned infrastructure including the Bharatnet inventory. Basis the adoption of the same, we can further determine on the usefulness and efficacy of this platform. Accordingly paving the way for private players to onboard their inventory on the e-marketplace for sale.

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.**

Response: No comments

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?**

Response: No comments

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.

Response: No comments

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.

Response: No comments

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.

Response: The prime reasons for FWA not being popular in India are non-availability of enough spectrum and extremely high spectrum cost. Typically, operators that provide FWA services in developed countries, hold hundreds of megahertz of spectrum at

affordable cost. In contrast, average spectrum holding in India is 45 to 54 MHz. In order to encourage FWA, DoT should make enough spectrum available to the TSPs/ISPs at prices that would make viable business for them.

Adequate and appropriate License free spectrum should be made available to the ISPs /Access Providers for provision of broadband using FWA technology.

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.

Response: No comments

Q.27: Is there a need of any policy or regulatory intervention by way of mandating certain checks relating to contention ratio, latency, and bandwidth utilisation in the core network? If yes, please suggest the details. If no, then specify the reasons and other ways to increase the performance of the core networks.

Response: The core networks of the TSPs/ISPs operate at scale given that it is the common infrastructure for enabling connectivity to the end users via its Points of Presence. These core networks work on fiber based infrastructure which enables it to scale to large capacities as and when may be required. It may further be noted that issues outlined in the question are mostly observed on the access / last mile of the connectivity rather than in core networks. As such, we do not see the need for any policy or regulatory intervention relating to contention ratio, latency and bandwidth utilization in the core network.

Q.28: Should it be mandated for TSPs and ISPs to declare, actual contention ratio, latency, and bandwidth utilisation achieved in their core networks during the previous month, while to their customers while communicating with them or offering tariff plans? If no, state the reasons.

Response: Please refer to the answer against Q. 27. With that context in mind, we do not see the need for any mandate for TSPs/ISPs to declare actual contention ratio, latency, and bandwidth utilisation achieved in their core networks in communicating to the customer.

Q29: 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.

Response: Slower mobile broadband speeds are not because of technology nor due to RAN design. The prime reasons for slower speeds are lack of enough spectrum and exceptionally high spectrum cost (while the spectrum cost is highest in the world, the data charges are the lowest). Typically, operators from the developed world hold ‘n’ X 100MHz + of cheap spectrum. In contrast, average spectrum holding in India is only 45 to 54 MHz.

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.

Response: There is no need of any policy or regulatory intervention by way of checks relating to RAN user plane congestion. The user-plane congestion is primarily owing to inadequate access spectrum. The remedy is to make adequate spectrum available at reasonable price. The average spectrum holding in India is 45 to 54 Mhz as against that 'n'' X 100MHz + being available with the telcos from the developed world. Another important measure would be to make E-Band and the V-Band spectrum available for backhaul applications as per the TRAI's earlier recommendations in this context (which is pending with the government for the past five years), else the expensive Fiber Backhaul (RoW + High TAT) tends to slow down operators from aggressive rollout of broadband coverage.

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.**

Response: No comments

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.**

Response: India is a developing country, and the average purchasing power of the Indian consumer is low when compared to some of the developed countries in the region and world. Consumers purchase mobile/telecom/ICT devices based on their use-case and willingness to spend. Affordability is a major factor that has helped in the strong telecom penetration in the country and made telecom connectivity affordable for all. Apart from the existing minimum standards from a safety and a consumer protection point of view, enforcing any other standards for quality or performance may make such devices un-affordable of the end consumer in certain cases. Device affordability and quality is governed by market forces, mainly consumer and competition and it should continue to do so.

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 have potential of affecting affordability or accessibility or both for consumers? Please justify your comments.

Response: Same answer as Q # 32