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Response to TRAI Consultation Paper on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed

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TRAI CONSULTATION PAPER ON ROADMAP TO PROMOTE BROADBAND CONNECTIVITY AND ENHANCED BROADBAND SPEED

We thank the Telecom Regulatory Authority of India ("**TRAI**") for its continuing efforts towards greater broadband deployment and adoption in India. We note at the outset in the time that has elapsed since TRAI's last consultation on the subject (2014) the broadband connectivity landscape in the country has evolved significantly. While the TRAI has also in the past sought public comments on proliferation of wireless broadband services (2016-17) as a means of achieving wider broadband connectivity, the increase in the reach and significance of e-commerce and e-governance applications, has raised questions regarding the extent to which wireless/mobile broadband alone could achieve the Government's development goals.

Recognizing the evolving landscape, the National Digital Communications Policy, 2018 ('**NDCP**') envisioned *"universal coverage rather than revenue maximization"* and *inter alia* aimed for:

- universal broadband connectivity at 50 Mbps to every citizen;
- 1 Gbps connectivity to all Gram Panchayats of India by 2020 and 10 Gbps by 2022;
- enabling 100 Mbps broadband on demand to all key development institutions, including all educational institutions;
- enabling fixed line broadband access to 50% of households.

Likewise, in 2019, the Government launched the National Broadband Mission (**NBM 2019**)[1] which sets out several steps towards fulfilling the goal of NDCP and operationalize "Broadband for All".

Moreover, the ongoing COVID-19 pandemic has resulted in every enterprise, public or private, as well as the common person, being more dependent on the broadband connectivity for interaction and services. The Internet has penetrated almost the entire sphere of modern social and economic activity globally, and India can only achieve its true potential once broadband connectivity reaches the last mile. The Supreme Court of India too, in *Anuradha Bhasin v. Union of India*[2] has recently recognized the essential role of the Internet today.

Broadband has also driven widespread changes in the Information Technology (IT) sector, enabling better services such as cloud computing and mobile apps. It is equally influencing innovation across many other sectors including health, education, transport and government. Indian government's flagship 'Digital India' programme[3], and the goal of creating a USD 1 trillion digital economy by 2025, largely depends on robust, reliable, consistent, low latency and high-speed broadband infrastructure in the country.

In this context, the current Consultation Paper on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed ("**CP**") is both timely and relevant, especially in the extent it furthers the vision of the NDCP 2018 and the NBM 2019.

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[1] https://dot.gov.in/sites/default/files/National%20Broadband%20Mission%20-%20Booklet_0.pdf?download=1
[2] W.P. (C) No. 1031 of 2019
[3] MeitY, Digital India Programme, available at https://www.digitalindia.gov.in/.

Current State of Play

It has been broadly estimated that a 10% increase in broadband penetration in a country could potentially lead to an 1.38% increase in GDP in developing countries.[4] However, studies in India estimate that the impact could be significantly higher for the country, given the increased productivity and efficiency gains that are likely to accrue to the economy.[5]

In light of this, we believe that universal broadband internet access should be treated as a public service in the lines of other infrastructure services such as highways and roads, railways, water and electricity etc. where the State should proactively encourage and facilitate penetration and universal availability. The phenomena of online education classes, telemedicine and online payments, are simple evidence of how essential fast and reliable Internet connectivity is today.

India has a large base of internet users; however, the internet penetration rate in the country stood at around 50 percent in 2020.[6] In the past, with the introduction of wireless mobile internet and more dependency on mobile network, there was almost no growth in wired broadband connections for a few years. However, due to Covid-19, and the mandatory work from home scenario, it appears that there is an increase in demand for wired broadband connections to meet their requirement of high-speed internet. However, despite the wireless communication having reached many outlying and remote villages, a greater part of rural India hasn't been penetrated by broadband and high-speed network. Enabling broadband connectivity across the country is essential to bridge the digital gap between rural India and urban India.

Hence, the Government should also give priority in enhancing the fixed line connections at a certain speed with the sole aim of improving the scope to enhance fixed line broadband access, which clearly has been the leading technology for broadband penetration in India. This in turn will also result in increased use of optical fibre in the access network in order to meet the requirement of high bandwidth demands. The aim of the Government, therefore, should be to achieve the outcomes and deliverables outlined in the NBM 2019, as provided below:

- to institutionalize public private partnership for leveraging optical fiber network and to provide last mile connectivity by utilizing appropriate technologies including optical giber, radio network and satellite for providing broadband access to all villages by 2022;
- to provide infrastructure capable of delivering high broadband speeds;
- to accelerate fiberization and work with state/ UTs to (a) have their Right of Way policy aligned with the RoW Rules (as defined below), (b) for supporting viable financial model for common duct;
- to create Broadband Readiness Index;
- to enhance connectivity and Quality of Services ("**QoS**") by increasing tower density and add more 5G telecom towers;
- to increase fiberization of telecom towers and to facilitate telecom towers to have robust backhaul in order to cater to high volume data requirement and for better QoS;
- to create a Geographic Information System based tool for accurate town planning for new networks and to set up a National Fiber Grid for keeping record of the entire optical fiber network in the country;
- to facilitate rollout of 5G network and strengthen the existing 4G network by identifying gaps required in infrastructure; and
- to promote Make in India and incentivize homegrown broadband products in the network through large scale trials and deployment.

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[4] http://pubdocs.worldbank.org/en/391452529895999/WDR16-BP-Exploring-the-Relationship-between-Broadband-and-Economic-Growth-Minges.pdf f
[5] https://dot.gov.in/sites/default/files/Final%20NDCP-2018_0.pdf
[6] Internet usage in India - statistics & facts, available at https://www.statista.com/topics/2157/internet-usage-in-india/#:~:text=Despite%20the%20large%20base%20of,access%20to%20internet%20that%20year.

We note, that the TRAI in the past has also made substantial recommendations on improving broadband proliferation and performance in India. The TRAI should continue to pursue some of its own recommendations, as discussed in Chapter 2 of the CP, that have not been accepted and implemented till date.

That being our general submission, for the remainder of our response to the CP, we have highlighted certain recommendations below on a chapter-wise basis.

1. Chapter 3: Broadband Definition

1.1. The current definition of 'Broadband', as notified by the Department of Telecommunications ("**DoT**") and provided in the Quality of Service of Broadband Service Regulations 2006, is not aligned with the goal and visions established by the NDCP which envisages broadband connectivity at 50 Mbps.

1.2. In this regard, we note that given the significant role played by mobile broadband in ensuring wider internet connectivity, one overarching definition of 'broadband' need not be best suited for encouraging greater investments in universal broadband access. Therefore, even though most countries have not yet adopted the practice of fixing Broadband definition and speed separately for 'fixed' and 'mobile', we support a move for India to have a separation of the definitions.

Defining Fixed Line Broadband

1.3. There are several parameters, along which the term broadband/ fixed lined broadband has been defined. According to the Institute of Electrical and Electronics Engineers (IEEE), U.S.A., *" "broadband" should represent the overarching and evolving concept of a system that embraces the various dimensions of digital communications, such as speed, latency, place, purpose, technology, availability, reliability, and scalability. In short, the function of the broadband system should be to carry out any digital application across all of its dimensions."* [7] Additionally, IEEE also considers technical definitions for broadband, specified in terms of average delivered bits per second, with a maximum latency, and a probability of delivery of no less than 99%.

1.4. Likewise, the Government in the NBM 2019[8] contemplates providing upto 4 Mbps of broadband speed in the first year, upto 10 Mbps in the second year, upto 25 Mbps in the third year, upto 30 Mbps in the fourth year, and upto 50 Mbps in the fifth year. However, it should be noted that the National Broadband Mission Plan does not provide for a minimum speed and this is where the definition of "broadband" in the current regulations becomes relevant.

1.5. Lastly, as noted by TRAI in para 3.27 of the CP, we agree that *"non-revision of threshold speed for broadband may not encourage ISPs and TSPs to upgrade their networks to deliver higher broadband speed, and that in-turn may adversely impact another objective of the NDCP- 2018, i.e., to "Provide Universal broadband connectivity at 50 Mbps to every citizen".* The U.S. Federal Communications Commission appears to have recently revised its definition of broadband (to actual download speeds of at least 25 Mbps and actual upload speeds of at least 3 Mbps) for this reason.

1.6. Therefore, we recommend that the definition of the fixed line broadband in all relevant policies and regulations should be revised to mean a minimum actual download speeds of 4 Mbps (which is line with the aspiration in the NDCP) and minimum actual upload speeds of 1 Mbps.[9] TRAI should consider periodically updating this definition as time progresses, according to the targets specified in the NDCP/ NBM. In our view, the definition proposed in not overtly ambitious, having regard to certain

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[7] Summary of Broadband Definition Proposals – IEEE Mentor, available at https://mentor.ieee.org/802.18/dcn/09/18-09-0098-01-0000-summary-of-broadband-definition-proposals.doc
[8] https://dot.gov.in/sites/default/files/National%20Broadband%20Mission%20-%20Booklet_0.pdf?download=1
[9] 1 Mbps upload speed appears to be an appropriate counterpart of 4 Mbps download speed. See 2010 Sixth Broadband Progress Report, 25 FCC Rcd at 9558, para. 4.

developing economies like Bangladesh, which have defined broadband even more aggressively at 5 Mbps.

1.7. This revision in the speed may encourage Telecom Service Provider ("**TSP**")/ Internet Service Providers ("**ISP**") to upgrade their network in a phased manner. Further, the DoT/ TRAI can also direct the TSPs/ ISPs to report on a quarterly basis all such connections that fall between 256 Kbps and the revised broadband threshold, which in turn will help the Government/TRAI to share the data with ITU, which seems to be a concern of TRAI. This may also help achieve another objective of NDCP i.e. *"Propelling India to the Top 50 Nations in the ICT Development Index of ITU from 134 in 2017."* Further, there is also a need to establish a defined maximum figure for latency.

Defining Mobile Broadband

1.8. For mobile broadband ensuring delivery of minimum threshold of speed may not be practical due to technological limitations. Wireless broadband is based on 3G/4G and has different speed limitations. 5G technology will provide higher data bandwidth. However, _we recommend that_ for mobile broadband too, the same definition as suggested for fixed line, with minimum speed criteria be adopted. However, if it is not found feasible to provide such a minimum for mobile broadband due to technology limitations, the definition may be technology dependent, and mobile broadband may be defined as follows, in line with the German and Brazilian approaches: "*Mobile broadband is access to internet through 3G technologies and higher speed mobile technologies*"

2. Chapter 4: Infrastructure Creation

2.1. At the ground level, the Indian Telegraph Right of Way (RoW) Rules, 2016 has not enabled grant of RoW permission in time at reasonable manner and appears not to have percolated well to the ground level. Greater awareness needs to be built in this regard. Ideally, town planning authorities should take this as a part of their scope of planning and there should be a provision in the building approvals for necessary ducts and pits to reach the street connectivity. Further, building approval rules must take into account connectivity to the closest fibre distribution pit and planning pits.

2.2. There is also increased need to establish a multi-stakeholder coordination committee, which should have the powers to address the common issues relating to RoW permissions. This committee can design the rules and regulations and formulate plans on coordination with local bodies. Such rules and regulations or related circulars should also be made easily available online.

2.3. There is a need to develop common ducts along the roads and streets for laying Optical Fiber Cables ("**OFC**"). Hence, it is better to come up with a common template duct model. This should be one of the top priorities to strengthen the network back-bone in India. Common ducts can be used for OFC, power and smart-city Infrastructure etc. Currently, there is no standard policy for laying the fiber and hence one sees fiber cables pulled over trees, poles etc. which are prone to frequent failures.

2.4. The development framework of common ducts should be similar to the undersea cable governance and management. All OFCs should be routed via metallic ducts and should be laid along the roads. All TSPs should form a governing body for managing and supporting the common ducts infrastructure. The availability of the fiber should be key metric to measure the quality. Also, in case of any roadside work, the local municipal authority or the local government bodies should notify all the TSP in order to conduct risk assessment.

2.5. In apartment and township kind of models, ducts are fairly common of late. States' town planning departments should come up with a common ducting framework to consolidate the ducting to a 'Dig Once Policy'. Every building should ideally have a common duct so that it is ensured that it is connected to the nearest fiber panel where all the ISPs install their equipment.

2.6. National Highways Authority of India (NHAI) or any infrastructure development companies can include a connectivity plan so that all National Long Distance (NLD) fibers run through these common ducts for OFCs and maintenance become easy, and ISPs get the duct for reasonable rent. Further, the infrastructure companies who provides ducts along the path should be allowed to collect the toll with a premium or be given a subsidy/incentive to encourage connectivity.

2.7. We also agree with TRAI on sharing electric poles for hosting small cells infrastructure, since this will undoubtedly facilitate faster rollout of 5G networks in India.

2.8. TRAI may also pursue vigorously the acceptance and implementation of its past recommendations on infrastructure sharing.[10] Infrastructure sharing model (including passing and active network) should be seen as a preferred approach in expanding the broadband connectivity since it will help in preserving competition and commercial sustainability, allowing the TSP to reduce the investment cost while also maintaining the revenue opportunities.

3. Chapter 5: Promoting Broadband Connectivity

3.1. As mentioned earlier, growth in broadband connectivity in India has been somewhat one-dimensional. Mobile data connectivity is widely available, and it marks as an alternate for fixed line broadband. Competitive tariff plans which offering both data and voice, ease of configuring and tethering, and low overheads (the subscriber doesn't have to invest in Wi-fi routers, etc.) have led to faster and wider adoption of mobile broadband as the primary mode of internet connectivity for a majority of internet subscribers in India. However, with average data usage per user increasingly constantly owing to greater dependence on broadband for day to day activities including essential services, education, health, jobs etc., the demand for fixed line connectivity may increase owing to greater bandwidth requirement for some such applications.

3.2. Accordingly, we believe that there is a need to be prepared to meet increasing fixed line connectivity demands. OFCs must be deployed at reasonable costs to enhance fixed line connections. Local Cable TV Operators (LCOs) should be encouraged and broadband through cable technology should be deployed to meet service delivery norms in the current dead zones, remote areas and to provide reliable and high-speed broadband connectivity to panchayat and village-level government institutions.

3.3. One of the concerns of the TRAI is that even though mobile broadband services are easily available and accessible, 40% of the total mobile subscribers do not access data. Providing mobile internet access to such people currently not connected will be more challenging, as they tend to belong to the most marginalised groups and are disproportionately rural, female, illiterate and older.[11] Further, deploying infrastructure for rural coverage is an economic challenge due to the higher costs required to roll out infrastructure in these areas, and the lower population density of rural users. It can cost up to twice as much to deploy new base stations in rural areas; they can be three times more expensive to run; and the average revenue per user can be a tenth of an urban deployment.[12] This lack of return on investment presents a significant obstacle to the operators for extending the reach of mobile broadband infrastructure to rural or isolated areas.

3.4. However, we believe that these figures are going to change drastically in the post-pandemic era, where there is increase reliance on the internet connections for everyday activities and TRAI should increasingly focus on collaboration models involving State, local bodies and private sector to roll out

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[10] TRAI Recommendations on "Enhancement of Scope of Infrastructure Providers Category-I (IP-I) Registration" dated 13th March 2020
[11] https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-State-of-Mobile-Internet-Connectivity-Report-2019.pdf
[12] https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/02/Enabling_Rural_Coverage_English_February_2018.pdf

proper infrastructure in rural areas so that there is increased penetration of broadband throughout the country.

Chapter 6: Broadband Speed Enhancement

3.5. One of the reason for slower fixed broadband speeds may be due to the core network design and the last mile connectivity issue. NIXI ports appear to be frequently congested for some TSPs. So, the capacity has to be increased at the peering sites to avoid latency. Also, investment in NIXI has to be stepped up to give a boost in the domestic traffic. Another reason could be use of old Digital Subscriber Line Access Multiplexer ("**DSLAM**") equipment having copper distribution on last mile. There may be an issue of oversubscription on one DSLAM in comparison to another and hence periodic review of capacity usage should be implemented.

3.6. Also, to provide good quality and reliable internet, there is a need of regulatory intervention by way of mandating certain checks relating to contention ratio, latency, and bandwidth utilization in the core network. The TSP and ISPs should also be mandated to declare on a monthly basis the actual contention ratio, latency, and bandwidth utilisation achieved in their core networks during the previous month to the customers and such data should be submitted with the TRAI or the DoT as well.

3.7. An ISP is supposed to provide a network performance reports through standard body so that users are aware of the performance score of each ISP. Similarly, TSPs should also be mandated 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). There is a scope of improving the service and customer experience by providing the committed uninterrupted bandwidth which should be backed up with metrics and measures for service performance.

3.8. Also, we believe standardization of consumer devices through industry led efforts should be encouraged and promoted in order to remove any end user device bottlenecks This will increase the adoption of internet data especially on the FTTH.