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## Ericsson's response to TRAI consultation paper on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed"

Dear Sir,

Ericsson welcomes the opportunity to provide response to TRAI consultation paper No. 06/2020 on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed". This is a timely consultation to aid the Government of India's vision on improving the digital penetration and broadband experience as per National Digital Communications Policy – 2018 (NDCP- 2018). Given the technology development in connectivity through 5G, the increase in 5G penetration with enhanced speeds will catalyze diverse applications in enhanced Mobile Broadband (eMBB), Ultra Reliable Low Latency Communication (URLLC) and massive Machine Type Communication (mMTC). 5G is expected to transform all sectors of the economy.

We have gone through the consultation paper and would like to submit our views for your kind consideration. We urge you to consider our recommendations while developing the broadband roadmap for India. It may be prepared with a balanced view of the potential benefits for increased availability and use of spectrum for Mobile Broadband and Fixed Wireless Access based services for Financial Inclusion, Bridging Digital Divide, Catering to the Urban needs for High Speed, Enterprise/ Business Demands, Broadcasting, Convergence of Networks and Technologies, Technology Evolution & Global Standardization, Development of Eco-System, Exponentially Growing/ Future Needs of Society, People and Government, and most importantly Sustainability.

Yours sincerely,

For Ericsson India Pvt. Limited,

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# Ericsson's Response

**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 enough?**
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: -**

a.  **Common or separate for fixed and mobile broadband?**

Fixed and mobile broadband should have separate definitions. When compared to fixed broadband services the mobile broadband based service depends on multiple aspects like available access and backhaul spectrum, the technology used, subscriber density and many other variable factors around the cell-sites like clutter of buildings, environments Hence it is recommended to have separate definition for broadband for them.

b.  **Dependent or independent of speed and/or technology?**

**Fixed broadband:** The definition of broadband should be based on various speed tiers instead of minimum speed.

As mentioned in Chapter 3 (see section 3.24-3.25) of the consultation paper, it is important and relevant for India to be able to report broadband subscriptions in various speed tiers to improve the ICT index for India. The multiple definitions of broadband and the respective speed tiers will help consumer to pick/identify the right one suitable for their application needs that range from basic internet access to real-time multiplayer gaming and streaming.

To address the increasing demand of high-speed fixed broadband, globally fixed broadband service is also being delivered through Fixed Wireless Access using 4G and 5G technology. Especially, FWA based on 5G in mmWave bands can deliver speeds in the order of few Gbps. Hence, it is important consider this solution too when defining various speed tiers. TRAI should also consider its 2015 recommendation of 2mbps while defining the lower speed tiers.

**Mobile Broadband:** definition should be based on the capability of Technology used to deliver the broadband. Unlink fixed broadband, mobile broadband speed across the cell-sites depends on the underlying technology (for e.g., 4G, 5G or combination of them) and the spectrum available to operator. Since deliverable speed depends on various spatial and time-dependent factors, it is not possible deliver a sustained download or upload data speed. There could be range of experienced

speeds even at the same location of the subscriber, hence defining broadband based on the speed for mobile broadband services is not meaningful.

### c. Based on download as well as upload threshold speed, or threshold download speed alone is enough?

Unlike typical internet access or exchanging emails, there are diverse usages of broadband and varies across age-group, geography, locations and time of usage. Both upload & download speeds are important to have the satisfactory user experience of the applications and hence both the speeds should be included in the respective broadband definitions

The mobile as well as fixed broadband connections are used today for Video calling, Video conferencing and social streaming and work collaboration. During the recent pandemic situation, there has been significant increase in the adoption of video conferencing both by working population as well as by students of all generation for attending remote class-room lectures.

### 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?

**Fixed broadband:** Since the broadband definition is based on different speed tiers, the inclusion in the tier may be based on the speed delivered in some statistical sense.

**Mobile broadband:** As explained earlier, the actual speed delivered for mobile broadband has dynamics that may not be possible to control. Hence, it is much appropriate to have multiple categories of the mobile broadband based on capabilities of the deployed technologies in the network.

The mobile broadband by cellular network is many a times combination of multiple technologies based on the subscriber density and demand in different areas. Higher data-rates are possible by combining multiple technologies like – Carrier Aggregation, massive MIMO, small-cell hot spots.  In the Ericsson technical report[1] , the advantages of combining LTE and 5G in 3.5GHz and 28GHz band has been shown.  To deliver such broadband speeds, sufficient spectrum of 100MHz in 3.5GHz and 800MHz in mmWave per operator would be needed to realistically enable such "high broadband speeds" in the network.

The actual capacity of the cell-sites can also get limited due to 5G device penetration or due to large scale low-end devices. Hence, despite good high-speed network capability, throughput experienced by individual users will vary.

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[1] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/the-advantages-of-combining-5g-nr-with-lte

We recommend that the definition of broadband for mobile broadband should not be based on the minimum speed or experienced speed of individual user.

Instead, the definition of broadband for mobile broadband services be based on the capability of the technology deployed in the network

**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: -**

**Fixed Broadband:**

In the response to earlier questions, we have attempted to address and justify that defining multiple broadband categories based on the speed tiers will help improve India's ICT index at global level. The various categories and the associated speed-tiers need to consider the growing demand and data-requirements of broadband applications that are widely used today and in near future.

As per Ericsson mobility report (June'20), typically, a fixed broadband connection is shared by on an average by three users at home.   In India, multiple entertainment content providers like Airtel Xtream, Jio TV, Zee5, Hotstar, SonyLiv, Netflix, Amazon Prime and others have realized a growing consumer base in recent times. Typical smart-TVs need 8–12Mbps for streaming a 1080p content and 5-7.5Mbps for rending in 720p resolution.  Conversational and bidirectional apps, such as video calling, require at least 1Mbps downlink/uplink throughput on hand-held devices, while media consumption could require up to 20Mbps downlink throughput for a good service quality.

Having multiple speed-tier based fixed broadband categories, will help report
broadband subscriptions in different tiers to ITU improve the ICT index for India. While defining the broadband for Fixed Broadband, the category should also consider the potential usage of Fixed Wireless Access based broadband using 5G in mmWave bands that can deliver broadband speeds in the order of Gbps.

To reflect such diverse usages, the speed-tiers for various broadband categories for fixed broadband may consider the above aspects. The category of broadband with the speed tiers will help consumer to identify the right ones suitable for their applications needs, ranging from basic internet access to multiplayer live gaming and streaming. TRAI may also consider its 2015 recommendation of speed of 2mbps as well as the NDCP 2018 targets of 50mbps while defining the various speed tiers.

**Mobile broadband**

As conveyed in earlier questions, the definitions for broadband for mobile broadband services should be different than the fixed broadband. TRAI may consider multiple broadband categories based on the underlying technologies and capabilities of the network. For e.g., a broadband category like "Ultra-High Mobile Broadband" may reflect the 5G networks based on NR in mmWave bands, that have capability to deliver speeds in the order of 10-15 Gbps.  When operator combines existing 4G network with mid-band 5G NR with sufficient spectrum of 80-

100MHz, broadband speeds between 200-400mbps can be delivered based on various conditions. Such high broadband speeds offered by 5G in mid-band are capable of many diverse eMBB applications.

As per Ericsson Mobility Report published in June2020 – Video traffic in mobile network is forecasted to grow by 30% annually. With the estimated common video traffic resolution of 480p in mobile network, will continue to grow and demand high-capacity mobile networks.

Introducing 5G with such capabilities in the network will be key to achieve the vision of NDCP that expects broadband speeds in the order of 50Mbps.

**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.**

**Response: -**

As per the GSMA's report (Sept 2020), on mobile connectivity Index, the global usage gap has not improved between 2015 to 2019, which is almost 43-45% of the population. There has been significant improvement in reducing the coverage gap from 20% to 7% in the same time-frame in the south-Asia region (India and other nearby countries), but the usage gap of 56% is the highest compared to other regions and needs attention from policy makers. There are several factors that are responsible for the digital disconnect, including the lack of digital literacy and limited adoption of digital platforms by common people. Few important ones are the affordability of smart phones, digital content in local language, gender equality for owning smart device, digital literacy and education.  And most importantly imparting trust in essential digital services like banking, -e-commerce and integration of government utility services like electricity, transportation etc.,

The role of state services, corporate social responsibility programs, non-government organization and policy makers is important to address the aspects to reduce the usage gaps.

Readiness to globally harmonized spectrum and regulation in India helps operators to leverage the benefit of growing network ecosystem and technology in those bands. This also indirectly reduces the cost of end-user devices that are developed for global technology and market and makes it affordable for wide population.

We would like to refer to few relevant industry reports that deal with similar matter for further consideration and deliberations.

1) https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/02/Enabling_Rural_Coverage_English_February_2018.pdf

2) https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-Closing-The-Coverage-Gap-How-Innovation-Can-Drive-Rural-Connectivity-Report-2019.pdf

3.  https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/offline-and-falling-behind-barriers-to-internet-adoption

**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: -**

For fixed broadband services, where FTTH could not be deployed, alternate technology solutions like Fixed Wireless Access should be promoted. Market segments where Fixed broadband penetration is limited due to challenges in the last-mile, Fixed Wireless Access (FWA) can be used as the last-mile solution. Please see response to Q25.

As per GSA's report, there are about 130 operators globally, who have either deployed, licensed or planning 5G deployment in the mmWave band between 24.25-29.5GHz across the globe. More than 37 operators have launched 3GPP compliant 5G FWA or home broadband services. This is a promising development for considering FWA as alternate solution to increase the broadband penetration. Policy measures are required to make the FWA solution affordable by enabling the sufficient spectrum in mmWave bands and appropriate licensing and regulatory conditions. It is also key that the policy leverages the benefit of the growing global ecosystem of technology as well as the economics of scale of mobile and CPE.

**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.**

**Response: -**

Fixed Wireless Access based broadband services can be deployed using the global 4G and 5G technology. The user equipment used to connect to the Fixed Wireless Access is through a fixed customer premises equipment (CPE) which are either placed indoor, close to windows or sometimes connected with externally mounted antennas.

To deploy 4G-LTE based FWA, operators would need excess spectrum in addition to the spectrum needed for providing mobile broadband traffic from the same sites. It would be challenging, especially in the urban or highly loaded cell-sites for operators to use the existing 4G spectrum. But countries[2] are considering licensing spectrum to operators, for deploying 5G based FWA

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[2] Australia completed its consultation which included licensing of portion of 28GHz band for FWA applications. Also see Ericsson's post - *https://www.ericsson.com/en/blog/2020/9/fwa-could-be-the-best-growth-opportunity-in-telecoms-right-now* on recent deployments of 5G based FWA.

https://www.acma.gov.au/consultations/2019-08/planning-options-28-ghz-band-consultation-092019#summary

services in the mmWave bands (26GHz and 28GHz). The FWA services in mmWave bands can offer very high-speed broadband in the order of Gbps.

In case of rural areas, under-utilized 4G spectrum can also be used to provide 4G LTE based Fixed Wireless Access.

Appropriate policy measures to enable operators to deploy the global 5G technology in the mmWave spectrum bands (26Ghz and 28GHz) which are globally being deployed for services including FWA will be critical to increase the fixed broadband penetration. This will help TSPs to plan and prepare for the fixed broadband services along with the mobile broadband. Access sites where there is a limitation of fiber backhaul, sufficient wireless backhaul need to be provisioned. The policy measures should also consider this aspect for availability and licensing of the backhaul spectrum for FWA deployment planning.