Telecom Regulatory Authority of India

Consultation Paper

on

Data Speed Under Wireless Broadband Plans

New Delhi

01.06.2017

Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan,
Jawahar Lal Nehru Marg,
Next to Dr. Zakir Hussain College,
New Delhi – 110002

Written Comments on the Consultation Paper are invited from the stakeholders by 29/06/2017 and counter-comments by 13/07/2017. Comments and counter-comments will be posted on TRAI's website www.trai.gov.in. The comments and counter-comments may be sent, preferably in electronic form on the e-mail: kapilhanda@trai.gov.in

For any clarification/ information, Shri Arvind Kumar, Advisor (Broadband & Policy Analysis) may be contacted at Tel. No. +91-11-23220209 Fax: +91-11-23230056.

Contents

CHAPTER - I

Introduction

Growth of Wireless Broadband Services

1.0   Today, wireless access networks are the main source of delivering broadband in the country. Global mobile subscriptions are growing around 5 percent year-on-year. As per the Ericsson's mobility report India grew the most in terms of net additions during the third quarter of 2016 by adding 15 million connections. These figures have increased substantially in the last few quarters. Out of the total 236.09 million broadband subscribers in the country as of 31st December, 2016 approximately 92.32% i.e. 217.95 million subscribers are through wireless access.

1.1   According to a GSMA report titled 'The Mobile Economy, India, 2016', at the end of June 2016, 616 million unique users subscribed to mobile services in India, making it the second largest mobile market in the world. Almost half the country's population now subscribes to a mobile service. The report suggests that improving affordability; falling device prices and better network coverage aided by operator investment will help deliver over 330 million new unique subscribers by 2020, taking the penetration rate to 68%. It further adds that as more users migrate to high-speed broadband, mobile data traffic is expected to grow 12-fold between 2015 and 2020, at a CAGR of 63%. Data usage by GSM users has already shown an unprecedented growth in the recent months from an average usage of 236MB per month in September, 2016 to 884 MB per month in December, 2016. Along with this, the composition of revenues earned by operators is also changing. Mobile operators in India have so far reported limited

revenue contribution from data services, generating 17% of service revenues at the end of 2015. This is forecasted to increase to 23% by 2020.

Definition of 'Broadband' Services

1.2   As per the Broadband Policy of 2004, broadband was initially defined as *"An 'always-on' data connection that is able to support interactive services including Internet access and has the capability of the <u>minimum download speed of 256 kilo bits per second (kbps) to an individual subscriber</u> from the Point of Presence (POP) of the service provider intending to provide broadband service where multiple such individual broadband connections are aggregated and the subscriber is able to access these interactive services including the Internet through this POP. The interactive services will exclude any services for which a separate license is specifically required, for example, real-time voice transmission, except to the extent that it is presently permitted under ISP license with Internet Telephony"*.

1.3   The Authority vide its recommendations dated 08.12.2010 on 'National Broadband Plan' inter-alia recommended that Broadband connection may be defined as

> *"A data connection using any technology that is able to support interactive services including Internet access and support a minimum download speed of 512 Kilo bits per second (kbps)". It is to be noted that the upload speed will atleast be half the download speed. This definition of broadband (both Wireline and Wireless), will be effective from 1st January 2011.The stipulated download speed of 2 Mbps will be effective from 1st January 2015."*

1.4   It is pertinent to mention that the National Telecom Policy of 2012

(NTP-2012) has the vision of ***Broadband on Demand*** and envisages leveraging telecom infrastructure to enable all citizens and businesses, both in rural and urban areas, to participate in the Internet and web economy thereby ensuring equitable and inclusive development across the nation. It provides the enabling framework for enhancing India's competitiveness in all spheres of the economy. Target and strategies as envisaged in NTP-2012 are as follows:

Target :

"3. Provide affordable and reliable broadband-on-demand by the year 2015 and to achieve 175 million broadband connections by the year 2017 and 600 million by the year 2020 at minimum 2 Mbps download speed and making available higher speeds of at least 100 Mbps on demand.

5. Provide high speed and high quality broadband access to all village panchayats through a combination of technologies by the year 2014 and progressively to all villages and habitations by 2020."

Further, Point 1.5 of part IV strategies contained in the National Telecom Policy-2012 states that**:**

"To revise the existing broadband download speed of 256 Kbps to 512 Kbps and subsequently to 2 Mbps by 2015 and higher speeds of at least 100 Mbps thereafter."

1.5   The Department of Telecommunication vide its Notification No. 4/4/2009-Policy-I dated the 18th July, 2013, amended the definition of broadband to read as under:

"Broadband is a data connection that is able to support interactive services including Internet access and has the capability of the minimum download speed of 512 kbps to an individual subscriber from the point of presence (POP) of the service provider intending to

provide Broadband service."

1.6   The amendment in definition of broadband in 2013 enabled wireless
       services such as Wi-Max/HSPA/WCDMA/EVDO/CDMA/LTE etc. to be
       counted as broadband services.

Broadband Speeds and Consumer Protection

1.7   The surge in the number of broadband connections in the country has
       also been accompanied by increasing reports of consumer
       dissatisfaction with the speed of data being provided to them under
       wireless broadband plans. Consumer empowerment and protection is
       a critical element of a well-functioning telecom market. Ideally,
       consumers who are dissatisfied with the services or prices offered by
       their operator should be able to easily switch to another provider,
       creating incentives for providers to innovate and offer competitive
       prices and Quality of Services (QoS). The ability of consumers to make
       rational and informed decisions in this regard is, however, constrained
       by several factors.

1.8   *Information asymmetry* refers to a category of market failures that exist
       in situations where one transacting party has access to more superior
       or accurate information compared to the other party. Broadband
       distribution offers a typical example of a complex service, with several
       dimensions that are important to customers, about which only the
       producer can supply the relevant information.[1] Non-disclosure of
       provisions of services like data speed, contract terms, latency, etc, are
       a matter of concern for consumers, which influence consumer
       satisfaction.[2] In order to bring about greater transparency in these

---

[1] Gerald R. Faulhaber, Transparency and Broadband Internet Service Providers, International Journal of
    Communication 4 (2010), 738–757, available online at http://ijoc.org/index.php/ijoc/article/viewFile/782/445.

[2] CUTS International and IIT Delhi, Mobile Internet services in India - quality of service, available online at
    http://www.iitd.ac.in/research/IITD/1615_QoS_Report_CUTS_IIT.pdf.

processes, telecom regulators mandate certain disclosures to be made by service providers to their customers.

1.9   Another issue that arises is that when disclosures are made they may not be in a form that can be easily understood by the consumer. For example, the widespread imposition of download limits or caps expressed in Megabytes or Gigabytes does not give consumers a clear understanding of how much content they can actually download.[3] The use of misleading advertisements by service providers further compounds these problems. Use of terms like 'up to' for data speeds has become a common occurrence although the theoretical speeds are rarely delivered.

1.10   Consumer choices are also affected by certain behavioural aspects. An OECD report on consumer protection in the telecom sector identifies the following as some of the behavioural issues that may be particularly relevant in this context:[4]

   a) *Choice or information overload*: consumers having too many products or features to compare may experience increased anxiety about the possibility of making a bad choice - a type of "analysis paralysis" can take hold when information and choices become very complex.

   b) *Endowment*: consumers may be reluctant to give up what they have, even though they would not buy such goods or services if they did not already have them (e.g. consumers may stay with a provider because of misplaced loyalty or a failure to acknowledge poor choices in the past).

   c) *Defaults and framing biases:* the ordering of options, particularly

---

[3] OECD, Enhancing competition in telecommunications: protecting and empowering consumers, Ministerial background report, June, 2008, available online at https://www.oecd.org/sti/consumer/40679279.pdf.

[4] Id.

in markets where a choice must be made, influences choice. Consumers often tend to opt for the "normal" or "standard" option. Consumer choice is also influenced by the "frame" in which information is presented.

d) *Hyperbolic discounting:* consumers tend to be short-sighted when making decisions with immediate costs or benefits to be weighed against future costs or benefits (e.g. consumers may not pay attention to the data rates that they will have to pay after exhausting their data packs).

e) *Heuristics:* consumers often take short cuts (e.g. by following rules of thumb) when the decision environment is too complex relative to their mental and computational capabilities. This may sometimes lead to sub-optimal decisions.

1.11 The coexistence of competing mobile telecommunications standards can also contribute to technological complexity and consumer confusion.[5] At present, service providers are selling SIM cards in the name of the underlying technology i.e. 2G/3G/4G. However, no speed whatsoever is being guaranteed by the service providers and not all consumers are aware of the difference between them.

1.12 A user has various options in terms of technology and tariff plans for both fixed and mobile broadband services being offered by the service providers. However, the mobility offered by wireless broadband services, their wider availability in diverse locations and availability of small denomination data packs has contributed to the popularity of wireless broadband services among Indian subscribers. At the same time, the delivery of wireless services also faces certain unique

---

[5] Id.

challenges that are discussed in the following sections. The widespread adoption of wireless broadband services in the last few quarters makes it particularly important to take into account the problems that may be faced by the users of these services, particularly in relation to data speeds.

1.13 Through the present Consultation Paper the Authority intends to seek the inputs of stakeholders on ensuring transparency and customer awareness regarding data speeds under wireless broadband plans. Chapter-II discusses the various initiatives that have been taken by the Authority in relation to broadband speeds in India and their current status. Chapter-III provides a summary of the international experience on similar issues. Chapter-IV discusses the various tools that may be deployed for measuring data speeds and finally Chapter-V lists the various issues for consultation.

Chapter II

Broadband Speeds in India

Past Initiatives on Broadband Speeds

2.0 Anticipating a higher growth rate in cellular wireless telephone service compared to wireline internet users and keeping in mind the necessity to monitor its QoS aspects, the Authority benchmarked the QoS parameters for wireless data service vide 'The Standards of Quality of Service for Wireless Data Services Regulations, 2012' (26 of 2012) dated 4th December, 2012. Through these regulations, the Authority mandated every Cellular Mobile Telephone Service (CMTS) provider or Unified Access Services (UAS) provider to install a measurement set up comprising of servers and test probes to measure, inter alia, the minimum download speed being provided for each data plan offered by the TSPs in the licensed service area. The Regulations define and lay down the measurement setup to be used to conduct test calls for measuring successful data transmission download and upload attempts, minimum download speed, average throughput and latency. The compliance reports of benchmarks of each QoS parameter is being reported by the service providers as laid down in the said Regulations.

2.1 The Authority, after having received a number of complaints from the consumers regarding the poor download speed experienced by them, examined the issue and felt that there was a need to mandate the 'minimum download speed' for the wireless data services provided through various wireless technologies, so as to protect the interest of consumers. Accordingly it released a Consultation Paper on 'Amendment to the Standards of Quality of Service for Wireless Data Services Regulations, 2012' dated 21st April, 2014.

2.2 In response to the consultation paper, service providers and their associations opposed the proposal to prescribe the benchmarks for minimum download speed. Their main concerns in this regard were limited availability of spectrum per operator in 2G/3G bands; low coverage zones such as basements, high rise building clusters, tunnels etc.; and variations due to external factors such as subscriber's device quality and type, number of subscribers browsing the data services, peak/off peak time, transmission bandwidth, external interference, website behaviour etc. Considering the views of stakeholders, the Authority decided against prescribing any benchmark for the minimum download speed for various technologies. However, through the amendments in the 'The Standards of Quality of Service for Wireless Data Services (Amendment) Regulations, 2014 (10 of 2014) dated 24th July, 2014', service providers were required to specify minimum download speed for all tariff offers of wireless data services, including tariff offered through tariff plans, vouchers, tariff offered for services provided through dongle or through other means. Service providers have also been mandated to ensure that the minimum download speed specified in their tariff plans is delivered for not less than 80 percent of the usage time. This was introduced as it was noticed that the advertised speeds differed substantially from the actual.

2.3 Service providers and their associations thereafter made a representation to the Authority citing various constraints. Various rounds of discussion were held with the service providers and alternative implementation methods suggested. These suggestions were also not acceptable to the service providers. Thereafter, as a via-media it was decided that as an alternative the service providers would jointly develop an app which would capture the speed obtained by the subscribers. However, the development of app was delayed by the

service providers. Meanwhile the Authority developed 'TRAI Myspeed' app and launched it on 5th July, 2016. The app allows subscribers to check the actual speed of their data connection and also report it to the TRAI server based on a crowd-sourcing model.

2.4 The major constraints cited by service providers are listed below:

a. *Mobile broadband speed depends on various factors*: The coverage of wireless technologies is dependent upon signal strength – Received Signal Code Power (RSCP) and Ec/No (interference factor) values. For coverage at any place, RSCP should be better than -99dBm while the Ec/No value should be greater than 14db. A location is covered only if both the parameters are met. In case, there are more than a specified number of users, or the data usage goes beyond a specified value, the coverage area of a cell shrinks due to increase in Ec/No values and therefore there can be a sudden decrease in coverage area which may lead to drastically reduced download speed in such scenarios. Providers have noted that the measurement methodology of TRAI may not correspond to the real life situations from the perspective of coverage; since the coverage locations will keep on shifting due to dynamic behaviour of presence of users and pattern of data usage.

b. *Mobile broadband is different from fixed broadband*: Apart from the usual factors affecting speed in fixed broadband i.e., link between web server and the telecom network, availability of web server, website behaviour etc., the mobile broadband download speed is dependent on other factors as well; such as;

   i. Number of concurrent active subscribers;
   ii. Type of application being accessed - with heavier data applications (music streaming or video), operators face different network planning

requirements;

iii. Location of the customer and distance from the base transceiver station (BTS)/Node B;
iv. Peak/off peak time/specific event;
v. Kind of device and customer-premises equipment being used.

Service providers have further stated that in case of India, the situation is different as there is a huge population and dependence on mobile broadband is much higher. On the other hand, in developed countries, fixed line broadband services have also come up substantially resulting in lesser dependency on wireless networks. Due to the dynamic conditions of wireless networks, test conditions results may vary significantly from the actual customer experience.

c. *Heterogeneous networks:* Different technologies may co-exist within the same network and data management capacity varies considerably between technology types. Thus, when technology on a cell changes, there will be changes to the service levels, which was not the case when only voice service was provided. In addition to change in technology, the change of cell type also influences the network parameters since, upon changing from one cell to another, there must be an available channel on the adjacent cell. For example, if there is a switch from Pico cell to macro cell with a high speed data application, the user might perceive a degradation in service.

d. *Technological standards do not support minimum download speed:* GSM and UMTS do not have a technological concept of guaranteed bit rate. The capacity on radio access medium in 2G/3G is shared on best efforts basis between all subscribers

latched to a site.

e. *Competitive pressures in the telecom industry*: Providers contend that there are around 7-8 operators in the country providing broadband services in each service area. Thus sufficient competitive pressure exists on each operator to provide high speed experience to the customer. Further, choices like mobile number portability make it very easy for the customer to shift the operator in case s/he is not satisfied with the broadband speeds.

f. *Consumer awareness*: With the advent of mobile apps, users are exchanging videos amongst themselves, playing interactive games – by which it has become very easy to compare the experienced data speed in real time. Also, there are lot of tools and applications available to the customer to estimate and measure the broadband speed provided by the operator.

Present Status

2.5 The telecom sector has witnessed many changes since 2014 when this issue was last taken up by the Authority. These changes include the launch of 4G and 4G LTE services, which are associated with higher data rates. According to a Nokia report, 4G has contributed 60% of incremental data traffic in 2016. The spectrum auction held in 2016, has resulted in additional spectrum availability of around 20 MHz to 84 MHz in most Licensed Service Areas (LSAs). As a result, spectrum holding per telecom operator increased by around 2 to 9 MHz in different LSAs. Now, spectrum holding per telecom operator is around 28 to 45 MHz in each LSA. Also, in the last few months, a number of merger & acquisitions have been announced in the sector resulting in consolidation of the industry and a move towards fewer numbers of

players.

2.6   On 31st October 2016 TRAI issued its revised directions on delivering broadband speeds in a transparent manner and provide adequate information to broadband consumers. The directions are applicable to both wireline and wireless broadband services although there are certain key differences in the obligations imposed on both sets of providers. In case of wireless broadband services, the operator is required to disclose the data usage limit with specified primary technology (3G/4G) and the speed offered after that limit on its website and in all advertisements.

2.7   It has been found that when comparing similar types of mobile and fixed service plans in terms of speeds promised, fixed line connections tend to be more consistent in their speed ranges. In case of mobile the subscriber generally perceives the speed to the theoretical speed (as mentioned in Table 1 below), which in most cases is below what is advertised. The mobile data speeds quoted by mobile network operators often appear to be at variance with those experienced by users. For instance, crowd-sourced data from TRAI's mySpeed portal shows that quite a few 3G subscribers throughout the country receive a download speed of less than 1 Mbps. Moreover, these `below 1 Mbps' speeds can go as low as 10 Kbps for some 3G subscribers

Sl No.	Generation	Technology	Download Speed (Theoretical)	Upload Speed (Theoretical)
1.	2G	GSM/GPRS	< 0.5 Mbps	20 kbps
2.	3G	HSDPA	1.8 Mbps	384 kbps
		HSUPA	7.2 Mbps	5.76 Mbps
		HSPA+	28 Mbps	5.76 Mbps
		DC-HSPA+	42 Mbps	11 Mbps
3.	4G	LTE	100 Mbps	upto 50 Mbps
		LTE- Advanced	150 Mbps	

Table1: Upload and Download Speeds for Various Technologies

Source : Qualcomm Report - Evolution of Mobile Technologies

2.8 Effective competition and informed choice are elements of well-functioning communications markets, and the Authority considers that information about the mobile broadband performance received by 3G and 4G customers will help consumers make informed decisions, and encourage providers to improve their performance. Therefore, it becomes increasingly important that consumers understand the differences between different data services. However, data network performance is only one part of the mobile quality of experience, with factors such as coverage quality of voice calls and customer service also playing a key role.

2.9 'The Standards of Quality of Service for Wireless Data Services Regulations, 2012 (26 of 2012)6 dated 4th December, 2012 prescribes that every CMTS provider or UAS provider must meet the following QoS benchmarks for the wireless data services in respect of each specified parameter, namely:

[6] http://www.trai.gov.in/sites/default/files/201212040445340111869Mobile_Data_Reg_%2004122012.pdf

Name of Parameter	Benchmarks	Average over a period
Service activation/ provisioning	Within 4 hrs with 95% success rate	One Month
Successful data transmission download attempts	>80%	One Month
Successful data transmission upload attempts	>75%	One Month
Minimum download speed	To be measured for each plan by the service provider and reported to TRAI	One Month
Average throughput for packet data	>75% of the subscribed speed	One Month
Latency	Data < 250ms	One Month
PDP context activation success rate	>= 95%	One Month
Drop rate	<=5%	One Month

2.10 Accordingly, the service providers are carrying out self testing and submitting their report on compliance of benchmark of each Quality of Service parameter to the Authority. The audit of the same is presently not being done. However, from the subscriber's perspective there is a requirement of an assurance of the download/upload speeds or at least better transparency about actual speeds that are likely to be experienced, which is presently not being met.

Chapter III
Technologies for Measuring User Experience

3.0 As noted in previous chapters, the Internet speed experienced by a user can be slower than expected for various reasons. Apps such as TRAI's MySpeed app and other similar services allow the user to test and detect lower network speeds. However, since there are multiple points in the Internet ecosystem which can slow down the speed of data packets, it can get difficult for users to identify the exact reason for their sluggish Internet experience.

3.1 Certain tools have been developed by providers and academics which can trace the path of data packets and try to identify the precise reason which is causing the slow speed for a user. These measurement tools can inform the users about the characteristics of their Internet performance. In case of a problem with the Internet connection, these tools can tell a user if the issue was caused by the Internet connection, the application or something else.[7] One such example is network measurement services offered by Measurement Lab (M-lab). M-lab has developed a tool called `MobiPerf' which measures network performance on mobile platforms. Through this open source platform, a user can measure the network's throughput and latency, as well as other useful network measurements like DNS lookup latency (ms), TCP uplink and downlink throughput (Kbps/Mbps), and IPv4/IPv6 compatibility etc.[8] These metrics can provide some guidance to end-

---

[7]   https://www.measurementlab.net/about/

[8]   https://sites.google.com/site/mobiperfdev/

users in terms where the bottleneck lies for their Internet speeds.

3.2   In addition, measurement tools are being developed which can specifically identify if there are any traffic management techniques applied by the service provider for a certain kind of traffic. This may result in blocking, throttling, or prioritisation of a particular content. The tools developed to identify the traffic management practices deployed by service providers range from checking differentiation based on application in use (e.g. Chkdiff, Glasnost) to content and routing-based differentiations in backbone (as opposed to access) ISPs (e.g. Net Police).[9]

3.3   Even though methods and tools exist to identify the source of degraded Internet speed, certain privacy and security concerns may arise on account of user and device data. While examining the source of slow speed, certain user activity at device or application level may have to be accessed and analysed. The location of the user may also have to be recorded. Such information could be linked to a particular individual leading to privacy concerns.

3.4   In addition, such analysis of user's network traffic may also pose security issues. If the measurement tools, designed to identify bottleneck for Internet speed, can get access to sensitive data of a user or proprietary information of businesses then it can result in financial harm to them. Further, these measurement tools, upon getting device level permissions, can also adversely affect the user systems through malware attacks.

3.5   Appropriate safeguards may have to built-in in order to address these

---

[9] Ofcom, A Study of Trac Management Detection Methods & Tools, August 2015 available at https://www.ofcom.org.uk/ research-and-data/technology-research/2015-reports/traffic-management

privacy and security issues. For example, data anonymisation can ensure that a specific Internet activity is not tied to a particular individual. It is also important to increase awareness among consumers about the availability of various technological tools and the potential concerns that may be faced while authorising device level permissions.

Chapter - IV
International Experience

4.0   Various other countries have also faced similar challenges in terms of ensuring that appropriate disclosures are made to consumers of broadband services, both in the context of fixed as well as wireless networks.

United Kingdom

4.1   Ofcom, the UK regulator, has conducted studies of mobile broadband performance in 2014, and then again in 2015.[10] This research was designed to assess the performance of various TSPs in the UK on their 4G and 3G networks. With the objective of ensuring that consumers have clear information about 3G and 4G mobile broadband network performance, and to enable easy comparisons between TSPs based on verifiable data, the testing measured four metrics: download speed, web browsing speed, upload speed and latency, which are explained as follows:[11]

> (i) Download speed – the rate at which data can be transferred from the Internet to a user's device (relevant to downloading files). This is most likely to affect the consumer experience when downloading very large files to a mobile device and when speed is insufficient (under 2Mbit/s) to support high capacity video services.

---

[10] OfCom, Measuring broadband performance in the UK, 2014; OfCom, Measuring broadband performance in the UK, 2015.

[11] Ofcom (2015), ibid.

(ii) Web browsing speed – the time that it takes to load a standard web page to a mobile device (relevant to browsing the Internet and applications).

(iii) Upload speed – the rate at which data can be transferred from the user's device to the Internet (relevant for sharing of content over social media).

(iv) Latency – the responsiveness of the network, measuring the delay of transferring data to and from the user's device (relevant for gaming, video calls and web browsing).

4.2 While providers of mobile broadband services do provide information on the services they offer, including coverage maps and 'up-to' or 'typical' data throughput rates, gaps remain. For example, the currently provided 'up-to' or 'typical' data throughput rates are only rough estimations of actual performance and some coverage maps provide a binary 'yes' or 'no' reading without accounting for signal strength at particular locations, whereas other maps provide more layered readings (such as indoor/outdoor or 'good'/'better'/'best'). Given this variance, additional voluntary standards or principles could provide better information enabling consumers to make informed choices about mobile broadband services. For fixed line ISPs, Ofcom has preferred the self-regulatory mechanism of a "Voluntary Code of Practice for Broadband Speeds"[12] (hereafter, the Code) that invites fixed broadband ISPs to become signatories and comply with its provisions. The Code came into force in December 2008, and was most

---

[12] OfCom, 2015 Voluntary Code of Practice: Broadband Speeds, available at https://www.ofcom.org.uk/ __data/assets/ pdf_file/0012/ 40431/broadband_speeds_code_june_2015.pdf

recently amended in 2015. Most major ISPs in the UK are now signatories to the Code, covering over 95 per cent of UK residential broadband customers.[13] OfCom's core objective with the Code is to *"increase the overall standard of information on broadband speeds – and other relevant metrics – that should be made available to consumers at point of sale to help them make more informed choices of service products offered in the broadband market."*[14] Several principles in the Code, although applicable to fixed line broadband providers, might be relevant to consider in the mobile broadband context as well, such as ensuring appropriate training to customer representatives, information at point of sale and following the sale, presentation of information relating to data speeds on the service provider's website, accuracy of this information - and managing customer complaints.

4.3   The Code stipulates the parameters of the range of access line speeds made available to customers. For example, it could be based on the actual speeds achieved by a segment of the customers. Alternatively ISPs may adopt any approach which results in *"at least 60% of the customers achieving an access line speed within the range provided and must be set such that, in cases where customer's actual access speeds fall outside the range provided, fewer customers actual access line speeds lie below the bottom of the range than lie above the top of the range"* In addition to the expected access line speeds, ISPs are directed to explain the number of factors that may affect this estimate as well as any fair usage limits or traffic management policies. For example, ISPs must provide an explanation of factors that might cause peak time congestion such as major sporting events and the traffic shaping

---

[13]   http://www.ispreview.co.uk/index.php/2016/01/ofcom-uk-introduces-new-business-broadband-speed-code-of-practice.html

[14]   OfCom UK Home Broadband Performance, March 2016

policies to manage this. The ISP are also directed to communicate that customers can leave their contract without penalty if they receive an *"access line speed which is below the minimum guaranteed access line speed"*

United States

4.4   In 2010, the Federal Communications Commission ("FCC"), the American telecommunications regulator, conducted a survey to find that 80 percent of broadband users in the United States were unaware of the speed of their broadband connection. As a result, the FCC kick started a scientific study to measure home broadband speeds by installing specialized hardware in the homes of volunteers. While the 2010 survey only focussed on speed issues pertaining to fixed broadband services, the FCC subsequently released a Public Notice, seeking inputs from stakeholders on the best ways to accurately measure mobile broadband speeds, to publish and convey critical information to consumers on broadband speeds, and to improve transparency in mobile broadband performance.

4.5   With the objective of reaffirming its commitment to transparency, the FCC also passed the Open Internet Order in 2015. This order enhances the disclosure requirements by directing the ISPs to disclose network performance measured in terms of average performance over a reasonable period of time and during times of peak usage. The order specifically applies to mobile broadband providers as well. Further, it clarifies that mobile broadband service providers have the obligation to disclose network performance information for "each broadband service" for instance; separate disclosures have to be made for services with each technology such as 3G and 4G. The order also states that apart from small providers, mobile broadband providers today can be generally expected to have access to actual data on performance of

their networks representative of the geographic area in which the consumer is subscribing service—through their own or third-party testing mechanisms.[15]

4.6   In a recent move to further fortify the framework on transparency and disclosure requirements put in place by the 2015 Open Internet Order, the FCC has introduced consumer broadband labels called "Broadband Facts", for both fixed and mobile broadband services.[16] This consumer label intends to convey accurate information in a consumer-friendly format. Interestingly, it is designed along the lines of nutrition labels attached to packaged food products that set out the nutrition content of the item. The format of the consumer label mandates the disclosure of critical details that would enable consumers to compare services offered by different ISPs, such as provider prices, performance, and network practices. Instead of advertising wholesale network speed, the label format specifically requires service providers to disclose "typical speed", "typical latency", and "typical packet loss". The disclosure instructions attached to the notification clearly state that the provider should disclose typical peak usage download and upload speed for the network technology consistent with the Open Internet Orders.

---

[15] Report and Order on Remand, Declaratory Ruling and Order (February 26, 2015) available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf.

[16] Bureaus Approve Broadband Labels Proposed by Consumer Advisory Cmte (April 4 , 2016), available at https://www.fcc.gov/document/bureaus-approve-broadband-labels-proposed-consumer-advisory-cmte.

Figure1 : Sample Broadband Label

Broadband Facts

Mobile broadband consumer disclosure

Device Compatibility

If you want to use your existing device, learn more about compatibility.

If you want to obtain a device, learn more about prices and other options.

Choose Your Data Plan - These prices do not include costs for obtaining a device from us.

	High Speed Data allowance per month		
	1GB	3GB	5GB
Monthly charge	$35.00	$45.00	$60.00
When you exceed the data allowance	$10.00/Additional GB	Slowed speeds	NA

Learn more about other included services/features.

Additional pricing options, plans and promotions can be found here.

Coverage Map

Charges and Terms Common to All Plans

Monthly fees

Administrative fee	$1.20
Regulatory fee	$0.13

One-time fees

Activation fee	$50.00
Deposit	$50.00
Early termination fee	$240.00

Government Taxes and Fees, and Other Carrier Surcharges May Also Apply: Varies by location

Performance - Individual experience may vary

3G		4G
Typical speed 1.5 Mbps downstream / 600-900 Kpbs upstream	•	**Typical Speed** 6-12 Mbps downstream / 3-6 Mbps upstream
Typical latency Less than 120 milliseconds	•	**Typical latency** Less than 120 milliseconds
Typical Packet Loss 0.08%	•	**Typical Packet Loss** 0.08%

Network Management

Application-specific network management practices?	Yes
Subscriber-triggered network management practices?	Yes

More details on network management

Privacy	See our privacy policy
Complaints or Inquiries	To contact us: online/(123)456-7890; To submit complaints to the FCC: online/(888)225-5322

24

CHAPTER- V

Issues for Consultation

Q1: Is the information on wireless broadband speeds currently being made available to consumers is transparent enough for making informed choices?

Q2: If it is difficult to commit a minimum download speed, then could average speed be specified by the service providers? What should be the parameters for calculating average speed?

Q3: What changes can be brought about to the existing framework on wireless broadband tariff plans to encourage better transparency and comparison between plans offered by different service providers?

Q4: Is there a need to include/delete any of the QoS parameters and/or revise any of the benchmarks currently stipulated in the Regulations?

Q5: Should disclosure of average network performance over a period of time or at peak times including through broadband facts/labels be made mandatory?

Q6: Should standard application/ websites be identified for mandating comparable disclosures about network speeds?

Q7: What are the products/technologies that can be used to measure actual end-user experience on mobile broadband networks? At what level should the measurements take place (e.g., on the

device, network node)?

Q8: **Are there any legal, security, privacy or data sensitivity issues with collecting device level data?**

    a) **If so, how can these issues be addressed?**

    b) **Do these issues create a challenge for the adoption of any measurement tools?**

Q9: **What measures can be taken to increase awareness among consumers about wireless broadband speeds, availability of various technological tools to monitor them and any potential concerns that may arise in the process?**

Q10: **Any other issue related to the matter of Consultation.**

List of Acronyms

S. No.	Acronym	Description
1	CAGR	Compound Annual Growth Rate
2	CDMA	Code Division Multiple Access
3	CMTS	Cellular Mobile Telephone Service
4	DC-HSPA	Dual Carrier High Speed Packet Access
5	EVDO	Evolution Data Optimized
6	FCC	Federal Communications Commission
7	GSM	Global System for Mobile
8	HSDPA	High Speed Downlink Packet Access
9	HSPA	High Speed Packet Access
10	HSUPA	High Speed Uplink Packet Access
11	LSA	Licensed Service Areas
12	LTE	Long Term Evolution
13	NTP	National Telecom Policy
14	OECD	Organization for Economic Co-operation and Development
15	POP	Point of Presence
16	QoS	Quality of Service
17	RSCP	Received Signal Code Power
18	UAS	Unified Access Service
19	WCDMA	Wideband Code Division Multiple Access