Bharti Airtel Ltd.
India & South Asia
Airtel Center, Plot No. 16,
Udyog Vihar, Phase - IV,
Gurugram - 122 015

www.airtel.in
Call +91 124 4222222
Fax +91 124 4248063

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To,
Advisor (QoS),
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
J.L. Nehru Marg, Old Minto Road
New Delhi – 110002

Subject: Consultation Paper on Net Neutrality

Kind Attention: Sh. Asit Kadayan

Dear Sir

This is with reference to the above mentioned Consultation Paper on Net Neutrality. In this regard, please find enclosed our response for your kind consideration.

Thanking you
Yours sincerely
For Bharti Airtel Limited

Ravi P. Gandhi
Chief Regulatory Officer

Enclosed: As mentioned above

Bharti Airtel Limited's Response to TRAI's Consultation Paper on "Net Neutrality"

At the outset, we sincerely thank the Authority for providing us with the opportunity to submit our response to this consultation paper. We hope that TRAI will consider our submissions favourably.

Before we deliberate upon the various issues relating to net neutrality, we need to understand the challenges currently faced by the Indian telecom industry. While, the government's vision to transform India into a digitally empowered society and knowledge economy through the 'Digital India' and 'Broadband for All' initiatives is laudable, the transformation of this vision into reality will require massive investments, more spectrum and increased deployment of broadband infrastructure/towers/optical fiber, etc.

However, the industry is laden with a huge debt, which is in excess of INR 4.20 lac crores, and will require investments of more than Rs.5 lac crores in the coming years to accomplish the government's vision. The Indian telecom sector is subjected to one of the highest taxes and levies in the world. It is making a Return on Capital Employed (ROCE) of 1%, which is an unsustainable situation. So, without critical broadband infrastructure and necessary investments in place, the vision of Digital India and Broadband for All will be nearly impossible to achieve. India needs not only Net Neutrality, but also "Net Equality".

Therefore, any policy around Net Neutrality must first promote universal Internet access through affordable services, massive investments required to build the network, innovative services, and ensuring the same rules for same/similar services. We also believe that the principles of net neutrality should be applicable to all Telecom Service Providers (TSPs), content providers, handset manufacturers and other stakeholders operating within the Internet ecosystem. The business practices of all stakeholders should be fair, transparent and non-discriminatory.

To achieve this, the following would need to be implemented:

1. **A holistic view of net neutrality is needed:**

   The current consultation paper deals primarily with issues related to traffic management, instead of carrying out a comprehensive and holistic discussion on all issues related to net neutrality. We believe any framework of net neutrality should address the following issues:

   a. **Same Service, Same Rules:**

      In order to protect the competition and ensure fair play in the market, it is foremost that all services that are similar in nature are subject to the same regulations. Therefore, the concept of "Same Service, Same Rules" is very important.

      Over-the-Top (OTT) communication services such as voice and messaging, provided by various players, are direct substitutes for the services offered by the

TSPs, licensed under Section 4 of the Indian Telegraph Act, 1885. DoT's committee on Net Neutrality examined this issue at length and suggested that OTT service providers ought to be subject to the same rules and regulations regarding lawful interception, national security, payment of regulatory levies and taxes, data privacy, customer protection, etc., which TSPs have been subject to so far.

However, the current consultation paper does not delve into this important aspect. We believe that TRAI should address this issue while framing any opinion on net neutrality.

b. <u>The issue of Differential Pricing is intricately connected to net neutrality:</u>

The pricing of Internet services and its relation to content is essential to the discussion of net neutrality. However, TRAI's regulation on the "Prohibition of discriminatory tariffs for data service regulation" issued in 2016, forbids TSPs from offering free data/zero rating and differential data plans.

Although TRAI prohibits any discrimination in data tariffs or the offering of differential tariffs on the basis of content, it allows for differential/discriminatory pricing on the closed electronic communication network (CECN). This not only disrupts the level playing field, increasing the possibility of misuse, but also blocks all other opportunities for offering legitimate differential charges based on genuine business/customer needs. The indiscriminate prohibition of differential charging eliminates the scope of innovation in pricing and the creation of innovative products and also obviates or pre-empts many questions being raised in the present consultation paper.

Other countries have adopted a liberal approach to this issue. Globally, differential tariff plans/STVs are quite popular and are not seen as anti-competitive or discriminating against any content provider. Some of the telecom markets that have encouraged differential tariff plans/STVs are Singapore[1], Hong Kong[2], Thailand[3], Malaysia[4], UAE[5], Bangladesh[6], and Philippines[7].

Similarly, acknowledging the benefits of free data, countries are adopting a light-touch regulatory approach. For example, in the United States, zero rating plans used to be subjected to a case-by-case evaluation, but this has now been done away with completely. As per the Federal Communications Commission (FCC)[8], these free-data plans have proven to be popular among consumers, particularly low-income Americans, and have enhanced competition in the wireless marketplace. Going

[1] https://www.singtel.com/personal/i/phones-plans/mobile/prepaid/data-bundles#addons_social-data-plans
[2]https://www.three.com.hk/website/appmanager/three/home?_nfpb=true&pageid=6va301&_pageLabel=P20047039121956771059 4&lang=eng
[3] http://www.ais.co.th/one-2-call/en/package-addon-social.aspx?type=2&id=36
[4] https://www.xpax.com.my/internet
[5] http://www.etisalat.ae/nrd/en/generic/unlimited_social_data_plan.jsp
[6] https://www.robi.com.bd/internet/internet-and-wifi-packages/social-packs-internet?lang=eng
[7] http://www.du.ae/personal/mobile/specialoffers/kabayan-bundle-data-pack
[8] https://apps.fcc.gov/edocs_public/attachmatch/DOC-343345A1.pdf

forward, the FCC will not be denying Americans the chance to enjoy free data. Similarly, the European Union has also adopted a light-touch regime for zero rating plans by evaluating them on a case-by-case basis, rather than banning them outright.

Therefore, we believe in the need for a holistic deliberation of the issues related to net neutrality, which include differential charging and TRAI's regulation on "Prohibition of discriminatory tariffs for data service regulation".

2. **Each player in the Internet service sector needs to be subject to the same guidelines regarding Net Neutrality:**

The Internet services sector is not limited to TSPs/ISPs alone; it includes content providers, equipment/handset manufacturers, OTT players, entities dealing with smartphone operating systems, browsers, cloud service providers, caching and content delivery network (CDN) providers, etc. However, the questions posed in the consultation paper revolve only around TSPs/ISPs and do not take into consideration the other important stakeholders. We strongly believe that each stakeholder operating in the Internet service sector should be subject to the same Net Neutrality rules to ensure that all entities are treated equally and that the customer is not disadvantaged at any stage.

Some of the reasons for subjecting all types of stakeholders in the Internet sector to the same net neutrality regulations are as follows:

- Customer privacy has three significant sources of vulnerabilities—device, network and content providers—and any regulation that limits its scope to TSPs will not be able to holistically address the issue of data protection and customer privacy. While TSPs are forbidden from sending customer data outside India, other entities, such as browsers, applications, mobile Operating System (OS) and handset original equipment manufacturers (OEMs), are not.
- Throttling is not associated with TSPs alone, since it can happen at the content provider level as well. Recently, Netflix[9] admitted that they were throttling their streaming speeds for the subscribers of AT&T and Verizon. In addition, throttling can also happen for several other reasons such as new IP ranges, incorrect routing by an international bandwidth provider, outages or overflows at caching/CDN, etc.
- OS, browsers, the Cloud, device OEMs, and social media are all critical parts of the Internet ecosystem and significantly impact the experience of end users. Browsers that tunnel traffic under various "data save" modes end up controlling the user experience. Encryption at the OS level greatly impacts TSPs' ability to drive quality and de-facto transfers control to the OS. Cloud vendors can control speeds far more than TSPs but are out of the scope of this paper.
- Search neutrality[10] is an issue that requires due consideration. Today, a search engine may act as a potential barrier to information retrieval on the Internet. Issues such as suppression, favouring or depreciation of search results also require

[9] https://www.cnet.com/news/netflix-admits-throttling-video-speeds-on-at-t-verizon/
[10] https://www.mygov.in/sites/default/files/master_image/Net_Neutrality_Committee_report.pdf

deliberation in the Net Neutrality context. Many Internet service providers are now moving Internet traffic onto their own platforms through the use of tools like Accelerated Media pages in which websites that partner with the Internet service provider are prioritised on search results. Other nations are also bringing search engines under their legal framework. The ruling of the European Commission in May 2014 can be noted in this context, according to which, it held that its 1995 Data Protection Directive applied to search engines too, and gave Internet users the right to seek the removal of their personal information from the digital space so that it would not turn up on search engines and social media platforms.

- Other practices such as device control, preferential access and pre-burning, default messaging apps (e.g., iMessage), application stores, etc. should also be reviewed under the net neutrality framework.

Thus, the principles of net neutrality should be applicable to all stakeholders operating in the Internet service sector. Also, any pricing and tariff regulations on web-based content in India should be applicable not only to TSPs but to all stakeholders in the Internet services sector who are pricing their content/applications.

3. **<u>An ex-post regulatory regime will facilitate innovation:</u>**

In the last two decades, Indian TSPs/ISPs have acted very maturely and refrained from indulging in the activities of blocking, throttling or degradation of any content, service or application, unless directed under the law. Thus, India ought to adopt a 'cautious observation' approach[11] or, at the most, a 'tentative refinement' approach[12].

An ex-ante regulation should be applied only in the case of market failure or in the event that ex-post regulation is unable to address a given problem. Thus, an ex-post legal and regulatory framework for net neutrality would be the most appropriate to start with. In a principle-based regime, government authorities can look into the instances of non-compliance on a case-by-case basis.

4. <u>The regulatory regime should provide sufficient scope for innovation:</u>

India is one of the most competitive telecom markets in the world, with more than one billion wireless voice customers. This subscriber growth has been made possible due to light-touch regulation, private entrepreneurship and tremendous innovation across a large ecosystem of networks, devices and applications/VAS, which has resulted in customers enjoying the best of services at the lowest tariffs in the world.

To connect a billion people with broadband, we need to continue in the same spirit. The mobile industry can realize the vision of Digital India via collaboration amongst all its

[11] Cautious observation: The countries following this approach have taken note of NN issues and currently chosen not to take any specific measures to address them.
[12] Tentative refinement: These countries are following a light-handed approach, with some refinements to their existing regulatory regime governing communication services, but not going so far as to prohibit certain behaviours.

players, viz., application developers, content providers, handset manufacturers and network operators. This means focussing on innovations that lead to affordable Internet access, cheaper smartphones, lower cost networks, and broad-ranging applications as well as innovative pricing that enables more digital inclusion.

We believe that any method/technology/business model that enables people to use the Internet should be encouraged, as it would facilitate greater penetration of mobile Internet/broadband and, in turn, promote economic and social growth. Thus, an appropriate approach would be to ensure that all stakeholders follow the broad Fair, Reasonable and Non-Discriminatory (FRAND) principles and that the market forces allow all stakeholders to develop their business models and operate within the defined regulatory framework.

Q.1 What could be the principles for ensuring non-discriminatory access to content on the Internet, in the Indian context?

Airtel's Response:

1. We recommend a rational, proportionate, objective, ex-post, and principle-based framework for Net Neutrality, which promotes network investments and the vision of Digital India. While doing so, TSPs should have the flexibility to differentiate between different types of traffic to ensure that the Internet remains open and functional.

2. As TRAI rightly stated in its consultation paper, various countries are deliberating the principles of net neutrality based on their level of development, adoption of the Internet, state of content business, and the licensing and legal framework within which they operate.

3. Thus, India needs to follow its own principles of net neutrality, which are directed towards the achievement of the country's developmental goals, without compromising the rights of Internet users. Any policy on net neutrality should promote the investment in telecom infrastructure.

4. Furthermore, the policy framework of net neutrality should not be limited to wireless alone, since access to Internet is agnostic to the type of bearer. For example, Wi-Fi offload of mobile networks as well as carrier aggregation using Wi-Fi and mobile happens simultaneously. The policy framework should include content/application providers, handset manufacturers and other stakeholders in the Internet ecosystem as well.

5. We suggest the following objectives and core principles of Net Neutrality for the Indian context:
    - **Objectives:**
        i. To provide seamless access to Internet from all kinds of devices and access media
        ii. To promote network investments for improving connectivity and universal broadband access

iii. To support the Digital India vision of providing connectivity to all the unconnected end users in India
iv. To bring more people online and expand consumer choice through various innovations
v. To enhance the affordability and quality of broadband access
vi. To promote the ease of doing business
vii. To promote the synergies of network, content and application providers with light-touch regulation and commercial freedom

- **Principles**:
  i. No blocking of any content, applications, services and devices unless directed under the law
  ii. No degradation or throttling of lawful Internet based on commercial arrangements other than traffic management
  iii. To implement 'Same Service, Same Rules' across all types of service providers and to preserve national security
  iv. To recognize the unbridled right of users to access lawful content as per their choice without discrimination
  v. Transparent and reasonable Traffic Management Practices (TMPs)
  vi. To promote Fair, Reasonable and Non-Discriminatory (FRAND) business practices
  vii. To ensure that all stakeholders respect the privacy of end user data and to maintain the security and integrity of the network
  viii. To foster specialized services/enterprises services with assured QoS and with commercial tie-ups between TSPs and other entities

6. The DoT Committee's Report on Net Neutrality has recognized that we need not have a rigid definition of Net Neutrality, but may simply assimilate the core principles of Net Neutrality and shape its recommendations around them. As per the committee, the primary goals of public policy in the context of Net Neutrality should be directed towards the achievement of India's developmental aims by facilitating affordable, quality and universal broadband for its citizens, along with the following:
   - Expand access to broadband
   - Endeavour, through the Digital India initiative, to bridge the digital divide and promote social inclusion
   - Enable investment, directly or indirectly, to facilitate broadband expansion
   - Ensure the functioning of competitive markets in network, content and applications by prohibiting and preventing practices that distort competitive markets
   - Recognize the unbridled right of users to access any lawful content of their choice without discrimination
   - Support the Investment-Innovation virtuous cycle and the development of applications that are relevant and customized for users.

We request TRAI to consider the above-mentioned core principles of Net Neutrality as well as its applicability to other stakeholders operating in the Internet service sector.

Q.2 How should "Internet traffic" and providers of "Internet services" be understood in the NN context?

(a) Should certain types of specialized services, enterprise solutions, Internet of Things, etc. be excluded from its scope? How should such terms be defined?

Airtel's Response:

1. At the outset, we firmly believe that the principles of net neutrality should allow TSPs to explore various business models to bring new services and applications to consumers in a sustainable, long-term and cost-effective way. Progressive and future-proof net neutrality policy framework should promote, not restrict, the development of higher quality, guaranteed service delivery products from service providers, as these are key to unlocking and supporting future digital services and meeting end user needs.

2. We believe that many types of services can co-exist within a single network, including Internet access services that are delivered on a "best effort" basis and other data services that require assured delivery of certain applications and services (specialized services). On a broad level, specialized services are different from public Internet services and are in the nature of private networks rather than public communication. The provision of specialized services requires more than best-effort Internet connection and tailor-made connectivity for various commercial solutions. TSPs should continue to provide specialized services that are optimized for specific content, applications and services, or a combination thereof, wherever optimization is necessary to maintain a specific level of quality.

   Therefore, any service that is not a public Internet service should be considered a specialized service. Such services include Virtual Private Networks (VPNs), enterprise solutions, Internet-based video, Internet of Things (IoT), M2M and a whole range of innovative services for enterprises and consumers, such as remote healthcare/surgery, distance learning, and connected vehicles. The ability to offer specialized services with assured QoS will be critical in promoting consumer interests and national policy priorities. For example, M2M services require the creation of a differential quality of service network to meet the technical requirements of M2M/IoT.

3. In fact, DoT's Committee on Net Neutrality has also recognized the importance of managed/enterprise/specialized services. As per the committee, managed services, perceived as enterprise-related services, get the highest QoS priority along with voice and video. It inter-alia states that *"This may be allowed without affecting the minimum guaranteed QoS of 'Best Effort Public Internet. This committee is of the considered view that managed services are a necessary requirement for businesses and enterprises, and*

suitable exceptions may be made for treatment of such services in the Net Neutrality context."

4. Other jurisdictions have also recognized the importance of such services. For example, specialized services are permitted under the Net Neutrality Regulation of the European Union (November 2015)[13]. As per this regulation:

   Providers of electronic communications with the public including providers of Internet access services and providers of content, applications and services shall be free to offer services other than Internet access services, which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality.

   Providers of electronic communications to the public, including providers of Internet access services, may offer or facilitate such services only if the network capacity is sufficient to provide them in addition to any Internet access services provided. Such services shall not be usable or offered as a replacement for Internet access services, and shall not be to the detriment of the availability or general quality of Internet access services for end-users.

5. According to the Body of European Regulators of Electronic Communications (BEREC)[14] guidelines on Net Neutrality, regulation does not require an ex-ante authorization in relation to commercial practices, traffic management practices, specialized services or the agreements thereof. As per these guidelines, the term 'specialized services' stands for *"services other than Internet access services which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality."*

6. In fact, BEREC has observed that regulators should assess whether a service qualifies as a specialised one on a case-by-case basis. As per BEREC, typical examples of specialised services provided to end-users are VoLTE and linear broadcasting IPTV services with specific QoS requirements. Other examples include real-time health services (e.g., remote surgery) or *"some services responding to a public interest or by some new machine-to-machine communications services"*. Maintaining QoS might be especially important for corporate customers, as they might be in need of specialised services which—as they are addressing businesses—are often referred to as "business services". These cover a wide array of services and have to be assessed on a case-by-case basis.

[13] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R2120&from=EN
[14] http://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/6160-berec-guidelines-on-the-implementation-b_0.pdf

7. Similarly, the Federal Communications Commission (FCC), in its February 2015 order[15] on 'Open Internet', has also permitted specialized services. The order states that Broadband Internet Access Service (BIAS) does not include enterprise services, virtual private network services, hosting, or data storage services, and that non-BIAS data services will be treated as specialized services only to the extent that they are not the functional equivalent of BIAS. Connectivity bundled with e-readers, heart monitors, or energy consumption sensors would also be considered as "other data services" to the extent that they are provided by broadband providers over last-mile capacity shared with Broadband Internet Access Service. Additional examples of non-BIAS data services may include limited-purpose devices such as automobile telematics, and services that provide schools with curriculum-approved applications and content.

8. Therefore, we recommend that various types of specialized services, as elaborated above, should be excluded from the regulations that govern Net Neutrality. The provision of specialized services will promote greater investments in broadband infrastructure, without restricting the growth or capacity available for broadband Internet access services. Further, we believe that operators should have complete freedom to offer such services over their networks through various business models and tie-ups with third parties without any regulatory intervention.

9. We also believe that classifying certain types of use cases as specialized services will be a challenge. For example, vehicle tracking can be done through specialized hardware or through a smartphone application. Therefore, TSPs may file the details of the 'specialized services' being offered by them with TRAI on a regular basis.

10. Furthermore, the net neutrality framework needs to promote future investments in 5G technology. A fundamental enhancement brought by 5G would be the possibility of delivering virtual "network slices", offering different capabilities according to specialised needs. 5G network slices are meant to run on shared infrastructure without deteriorating the agreed-upon levels of service. To promote investments in 5G, a collaboration between TSPs and other stakeholders will be required to ensure that 5G can create substantial value by offering digital solutions that meet the actual business needs of the stakeholders.

Q.2 How should "Internet traffic" and providers of "Internet services" be understood in the NN context?

(b) How should services provided by content delivery networks and direct interconnection arrangements be treated?

Airtel's Response:

[15] https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf

1. We recommend that all the players operating within the Internet ecosystem, including Telecom Service Providers (TSPs), content providers, handset manufacturers and other stakeholders, should adhere to the principles of Net Neutrality.

2. To improve their services, many content providers use CDN to distribute content over the network, which helps to move content to the edge of the Internet and closer to the user. They usually use an overlay network before offering it for Internet access, to prevent the QoS from being impacted by traffic congestion in the Internet core. When consumers request content, it can then be delivered from a local server operated by the CDN providers. To further improve user experience, CDN providers are also peering directly with TSPs through mutual agreements.

3. DoT's committee on Net Neutrality also opined that *"CDN is an arrangement for management of content as a business strategy. Making available one provider's CDN to others on commercial terms is a normal business activity. Discrimination in access or adoption of anti-competitive practices by them is best left to be covered under the law related to unfair trade practices."*

4. As per the FCC[16], broadband Internet access services do not include VPN services, CDN, hosting or data storage services, or Internet backbone services, as they do not offer the capability to exchange data with all Internet endpoints.

5. Thus, we recommend that the provision of CDN and direct peering arrangements between content providers and TSPs should be based on mutual agreements. Adequate freedom should be provided to both parties (TSPs and content providers) to construct their arrangements without any regulatory intervention.

Q.3 In the Indian context, which of the following regulatory approaches would be preferable:

(a) Defining what constitutes reasonable TMPs (the broad approach), or
(b) Identifying a negative list of non-reasonable TMPs (the narrow approach).
Please provide reasons

Q.4 If a broad regulatory approach, as suggested in Q3, is to be followed:

(a) What should be regarded as reasonable TMPs and how should different categories of traffic be objectively defined from a technical point of view for this purpose?

Airtel's Response:

[16] https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf

1. Traffic management practices have always been adopted by operators so that the Internet can function effectively, efficiently and successfully, as it does today. This is especially necessary in a mobile environment, where spectrum is limited, to ensure a good overall QoS for what is a scarce resource.

2. In recent years, traffic management has become vital for service providers to optimize overall network performance and maintain a consistent QoS for users as they carry a diverse variety of traffic over their networks. Traffic management is becoming extremely critical as the growth in Internet users and increasing adoption of Internet services has resulted in IP transport networks becoming increasingly congested. For example, in recent years, the demand for mobile data has grown exponentially. Mobile data traffic in India increased by 89% between 2014 and 2015, with Indian subscribers consuming around 150 petabytes (PB) of mobile data per month in 2015. Mobile data traffic is expected to grow twelve-fold over the 2015 figures between 2015 and 2020, a CAGR of 63%. This is ahead of the overall growth in the Asia Pacific region, forecast at a CAGR of 54%.

3. Thus, TMPs are effectively helping service providers in managing the growing Internet traffic, protecting the network from impending congestion and maintaining the security and integrity of the networks. TMPs are also required for efficient utilization of bandwidth to meet the exponentially increasing data needs of customers.

4. Mobile operators deal with several constraints to ensure satisfactory QoS for all subscribers. Some of them are as given below:
    a. **Distance from a cell-site:** A primary consideration when evaluating the reliability of a mobile connection is the distance between the user and the closest cell site. Moving away from a connecting cell tower degrades the connection and provides a somewhat variable quality of experience as a consumer moves from one site to another.
    b. **Localized congestion:** Local factors can lead to traffic spikes that can potentially bring about congestion-related failure in wireless networks. Localized congestion may increase during festivals or other occasions with large public gatherings, and in times of emergency.

    c. **Time-sensitive traffic:** The Internet, akin to broadcast networks, displays off-peak and peak hour patterns of traffic. Internet traffic increases during peak hours, and smart traffic management serves to ensure that peak hour activity doesn't cripple networks.

    d. **Networking technology (2G/3G/4G):** The QoS of wireless networks also varies according to the connecting technology. Ensuring optimum QoS becomes increasingly challenging as a consumer switches from one technology to another during periods of mobility.

e. **Scarcity of spectrum:** The availability of adequate spectrum resources further affects the ability of TSPs to avoid network constraints.

f. **Devices:** Different devices and operating systems use the network in different ways, leading to varied service experience among users.

g. **Applications:** The application design that uses the data service also plays an important role in customer experience.

Due to the above-mentioned factors, as well as the continuously increasing Internet traffic, TSPs face several challenges that limit their ability to ensure a uniform QoS level for a wireless connection. **In fact, the only way each bit of data transmitted could have a uniform QoS is if every user had the same device located at the same place, all Cells had uniform distribution, there were no network constraints owing to the unavailability of spectrum, all Cell sites functioned on the same technology, and every user was equally distant from the Cell site.**

5. Today, Internet services operate on a "best effort" architecture and TSPs use traffic management to minimize the incidence and impacts of congestion, ensuring that as many users as possible get the best Internet experience. Traffic management is necessary for technical, operational and commercial requirements such as:

a. **Management of Network Congestion:** This is required especially for mobile broadband networks, where signal strength varies from location to location, in localized congestions, during mobility, and the non-availability of spectrum at all locations. Traffic management helps provide a better online experience for end users by using available network capacity more efficiently, thus helping network operators support a larger number of concurrent users.

Traffic management techniques are critical for managing congestion in mobile networks due to their inherent capacity constraints. Traffic management techniques provide an essential layer of efficiency which, along with ongoing investments in speed, capacity and coverage, help network operators cope with sudden spurts in data traffic. Appropriate traffic management techniques can improve the efficiency of broadband networks by 25-35 per cent, which not only results in better quality services but also reduces costs for consumers in the same proportion.

b. **Network integrity:** Traffic management techniques help TSPs protect end users from online threats such as spam and malware. Without such protection, end users would be exposed to a range of undesirable issues such as lower network performance, cluttered inboxes, greater risk of identity theft, and viruses.

c. **Child protection:** Traffic management also helps to apply content filters that allow access only to age-appropriate content.

d. **Delivery requirements:** Traffic management helps operators ensure that delay-sensitive services such as voice calls and video streaming work smoothly. This may require the use of prioritization techniques. Services that are non-real time, e.g., email, web browsing, etc., can be provided at lower priority during periods of congestion with little or no impact on user experience.

e. **Emergency calls:** Routing calls to emergency services, too, can be more efficiently performed through traffic management techniques.

f. **Enterprise Customers:** Traffic management techniques help in providing enterprise customers with the premium services required for their business needs without compromising on the QoS for ordinary users.

6. Although traffic management has been used in previous generations of networks, the need for it today is much greater than before due to the wider variety of services being offered and their different requirements. Similar to 2G and 3G networks, voice calls are prioritised over 4G networks based on open standards developed by international standards organisations.[17] Similarly, video conferencing will have to be prioritised over delay-tolerant services such as file sharing and emails to meet the consumer expectations for different services and to support critical communication needs. In fact, in its consultation paper, TRAI has recognized that some content (like video) requires high bandwidth whereas some applications (like real-time gaming) have very stringent requirements. Thus, traffic management will get more sophisticated as an increasing number of complex applications begin to use mobile networks and as a growing number of device types access those applications.[18] Network prioritization has always been envisioned as a part of the Internet Protocol and its implementation has been consistent with the specifications.

7. It should also be appreciated that traffic management takes place at every level of the Internet. Providers of handsets, browsers, virtual marketplaces and other services use traffic management practices to improve access to their pages on the Internet . Optimization, caching, intelligent traffic management and providers of CDN have a business model based on obtaining revenues by improving the quality of experience for end users. The framework of net neutrality should address the complete value chain and apply to all players in the value chain.

8. Therefore, it is critical for TSPs to have flexibility in deploying traffic management measures to manage the growing traffic, secure their networks, and deliver satisfactory services for the benefit of the consumers and the broader Internet ecosystem.

Approach to Traffic Management:

[17] For example, 3rd Generation Partnership Project (3GPP) has standardised Voice over Long-Term Evolution (VoLTE) for the provisioning of voice calls on LTE networks based on managed resource allocation for VoLTE calls.
[18] The vision for next generation 5G networks illustrates this complexity where billions of devices, from phones to cars, could communicate with each other within a fraction of a second.

9. In the consultation paper, TRAI has recognized that its own, and other stakeholders', understanding of many issues may evolve over a period of time on account of the development of more context-aware networks, the growth of specialized/non-Internet services and any other changes in the nature of traffic on the Internet. New innovations will result in different Internet speeds. For example, satellite links cause Internet latencies to be very high in remote areas like Ladakh. We have developed caching solutions at these areas, but by design these solutions cannot be fully neutral. In addition, 'https' traffic makes it hard for TSPs to understand which protocol is being used. Therefore, TSPs are able to perform traffic management on a 'best effort' basis, unless the content provider makes the type of traffic visible to TSPs. Therefore, any policy on traffic management not only has to consider the current challenges which TSPs are facing today, but also the challenges they may face in the future.

10. The DoT Committee's report has also recommended that legitimate traffic management practices may be allowed, but should be "tested" against the core principles of Net Neutrality. As per DoT's committee, the general criteria against which these practices can be tested are as follows:
    - *TSPs/ISPs should make adequate disclosures to the users about their traffic management policies, tools and intervention practices to maintain transparency and allow users to make informed choices.*
    - *Unreasonable traffic management that is exploitative or anti-competitive in nature may not be permitted.*
    - *In general, for legitimate network management, application-agnostic control may be used. However, application-specific control within the "Internet traffic" class may not be permitted.*
    - *Traffic management practices such as deep-packet inspection (DPI) should not be used to unlawfully access the contents of an application in an IP packet.* ***(Airtel's views are that TMPs such as DPI should be allowed to be used where there is no manual intervention and knowledge of the content is not stored in the system. However, such practices are to be used only for the purpose of routing and traffic management.)***
    - *Application-agnostic congestion control, being a legitimate requirement, cannot be considered to be against Net Neutrality. However, application-specific control within the "Internet traffic" class would be against the principles of Net Neutrality.* ***(Airtel's understanding is that application-specific control and discrimination within a category of traffic or across multiple categories should be allowed if that particular application is found to affect the integrity of the network or impair the overall QoS requirements by creating network congestion. In such cases, application-specific controls should not be viewed as a violation of Net Neutrality principles.)***
    - *Implementing a mechanism to minimize frivolous complaints would be desirable.*

11. We believe that any policy framework on TMP should be at the principle level to ensure transparency and safeguard against anti-competitive behaviour. TMPs that differentiate

between the types of traffic should be considered reasonable as long as they are not deployed anti-competitively to target and degrade the content or applications of a specific provider. TSPs will be required to differentiate specific types of content; for example, live TV and voice services will always need to be prioritized, as will several emergency services, self-driving cars, etc.

12. Furthermore, TSPs are not allowed to tinker with traffic even in case of security concerns or illegal content until security agencies respond, which is generally not prompt enough to be effective. Therefore, TSPs should be given the authority to cut off suspicious traffic or block illegal/pirated content.

13. We believe that the following approach may be considered:
    - Any TMPs that are deployed based on objectively different technical QoS requirements in order to maintain the overall transmission quality in an agnostic manner, should be treated as reasonable.
    - Any TMPs deployed to maintain the integrity and security of the network should be treated as reasonable.
    - TSPs/ISPs should be allowed to prioritise network management and control traffic over the rest of the Internet traffic on a real-time basis.
    - As stated earlier, the monitoring of IP packets, using practices such as DPI, should be allowed for the purpose of routing and traffic management and not be treated as a violation of Net Neutrality principles. TMPs should be allowed to monitor aspects of IP packets, which includes generic content such as information in the IP packet header and TCP header. Specific content, such as the transport layer protocol payload, should be monitored in case of any threat to network security and integrity.
    - The TMPs deployed for specialized services and other related services should be kept out of the scope of Net Neutrality regulations.

14. Other countries/unions such as the US and EU have adopted a broad approach by defining the terms for the reasonable use of TMPs by TSPs, as stated below:
    a. FCC[19] defines reasonable network management as a *"practice that has a primarily technical network management justification, but does not include other business practices. A network management practice is reasonable if it is primarily used for and tailored to achieving a legitimate network management purpose, taking into account the particular network architecture and technology of the broadband Internet access service."*
    b. As per the BEREC guidelines on Net Neutrality[20], the traffic management measures that monitor aspects other than the specific content, i.e., the generic content, should be allowed. The monitoring techniques used by ISPs, which rely on the information contained in the IP packet header, and the transport layer protocol header (e.g.,

[19] https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf
[20] http://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/6160-berec-guidelines-on-the-implementation-b_0.pdf

TCP) may be deemed to be generic content, as opposed to the specific content provided by the end users themselves (e.g., text, pictures and video).

15. We believe that any ex-ante regulation resulting in an overly rigid interpretation of the rules on traffic management would end up preventing innovative services from coming into the market which, when properly analysed, do not conflict with the goals of the regulation.

Q.4 If a broad regulatory approach, as suggested in Q3, is to be followed:

(b) Should application-specific discrimination within a category of traffic be viewed more strictly than discrimination between categories?

Airtel's Response:

1. We believe that any discrimination should be evaluated objectively and proportionately. Application-specific discrimination should take into account the reason for implementing such a practice.

2. For example, certain applications related to file-sharing systems, including torrent applications, may bring down the network by sharing copyrighted content illegally. To prevent network break-downs, application-specific discrimination would be needed and TMPs have to be implemented in order to completely block or throttle such applications. Therefore, Net Neutrality principles should allow operators to utilize such application-specific TMPs.

(c) How should preferential treatment of particular content, activated by a user's choice and without any arrangement between a TSP and content provider, be treated?

Airtel's Response:

We recognize that preferential treatment can be provided by a specific content provider to its users. Thus, we believe that all the players operating within the Internet ecosystem, including Telecom Service Providers (TSPs), content providers, handset manufacturers and other stakeholders, should be brought under the purview of the Net Neutrality framework.

Q.6 Should the following be treated as exceptions to any regulation on TMPs?
(a) Emergency situations and services;
(b) Restrictions on unlawful content;
(c) Maintaining security and integrity of the network;
(d) Services that may be notified in public interest by the Government/ Authority, based on certain criteria; or
(e) Any other services.
Please elaborate.

Airtel's Response:

We believe that the following should be exempted from the principle of net neutrality:

- Compliance with the Union Law (orders issued by courts and public authorities vested with relevant powers).
- Preserving the security and integrity of the network when compromised due to external threats such as cyber-attacks, spyware, viruses, malicious software, DoS attacks, IP spoofing, and hacking.
- Preventing impending network congestion and mitigating the effects of exceptional or temporary congestion, provided that equivalent categories of traffic are treated equally.
- Call routing to emergency services.
- Prioritizing emergency services over delay-tolerant services such as messages, file sharing, web browsing and emails to support critical communication needs and meet customer expectations.

Q.7 How should the following practices be defined and what are the tests, thresholds and technical tools that can be adopted to detect their deployment:

(a) Blocking;
(b) Throttling (for example, how can it be established that a particular application is being throttled?); and
(c) Preferential treatment (for example, how can it be established that preferential treatment is being provided to a particular application?).

Airtel's Response:

1. We fully support Net Neutrality and Net Equality, and are committed to ensuring the following principles to protect the open Internet:
    a. No blocking of any legal content, applications, services and devices.
    b. No degradation or throttling of lawful Internet traffic based on commercial arrangements other than traffic management.

2. The following terms may be defined as under:
    a. ***Blocking*** *– There should be no blocking of any lawful content, applications, services and devices, unless needed for legal/security/congestion-management purposes or to provide parental control.*
    b. ***Throttling*** *– There should be no intentional impairment or degradation of Internet traffic on the basis of commercial arrangements other than traffic management.*
    c. ***Preferential treatment*** *– There should be no preferential treatment on the basis of content, applications, services within the same class of Internet traffic. This definition does not include specialized services.*

3. The tests, thresholds and technical tools for detecting the practices of blocking, throttling, and preferential treatment can be framed on the basis of international best practices once the regulations have been finalized.

Q.8 Which of the following models of transparency would be preferred in the Indian context:

(a) Disclosures provided directly by a TSP to its consumers;
(b) Disclosures to the regulator;
(c) Disclosures to the general public; or
(d) A combination of the above.

Please provide reasons. What should be the mode, trigger and frequency to publish such information?

Airtel's Response:

1. As stated earlier in this response, we believe that the business practices of TSPs, content providers, handset manufacturers and other stakeholders operating within the Internet ecosystem should be handled in a fair, transparent and non-discriminatory manner.

2. We also believe that the level of disclosures to the customer and to the Regulator should be customized for better understanding. For example, disclosures at the point of sale (PoS) should enable the customers to make informed choices pertaining to services. Information regarding the dos and don'ts of traffic management practices shall be communicated through the TSP's website to the customers. However, the detailed policy on traffic management should only need to be submitted to DoT and TRAI.

3. The disclosure should be mandated only to the traffic related to Internet services and not to the traffic related to specialized services. Specialized services are governed by SLAs and the necessary information is disclosed to the customers.

Q.9 Please provide comments or suggestions on the Information Disclosure Template at Table 5.1? Should this vary for each category of stakeholders identified above? Please provide reasons for any suggested changes.

Airtel's Response:

1. At the outset, we believe that the information provided to end users should be simple and easily understood. For this purpose, TSPs often use simple tables of information, breaking down FAQs into simple language and 'yes' or 'no' questions to ensure that the customer finds the information accessible and easily comprehensible.

2. This consultation paper has laid out a detailed Information Disclosure Template meant for the customers at the point of sale. As per TRAI, the customers are required to be kept in the loop about the price information and commercial terms, performance characteristics of their service (device compatibility, coverage, typical upload and download speeds, latency, and packet loss), service limitations and traffic management practices, specialized services, etc.

3. We believe that the proposed Information Disclosure Template is too complex for the general customer to understand. Making such high-level, complex data available at points of sale as per the specified format would be nearly impossible due to the large number of PoS (in millions). It will also be a challenge for the retailers/agents to understand such complex information and explain it to the customers. Such an advanced level of information will only end up confusing the customer and deter them from reading even the information essential for them.

4. Therefore, we reiterate that the disclosure to the customer should be in simple and understandable language, in order to help the customer to take informed decisions. Information related to traffic management practices at a broad level can always be put up by TSPs on their website whereas the detailed policy regarding TMPs can be filed with TRAI and DoT.

Q.10 What would be the most effective legal/policy instrument for implementing a NN framework in India?
(a) Which body should be responsible for monitoring and supervision?
(b) What actions should such body be empowered to take in case of any detected violation?
(c) If the Authority opts for QoS regulation on this subject, what should be the scope of such regulations?

Airtel's Response:

1. As elaborated above, we recommend that the principles of Net Neutrality be made applicable to all stakeholders operating in the Internet service sector (TSPs, OTT Communication Service Providers, content providers, handset manufacturers, etc.). This would require an all-encompassing legal and regulatory framework that includes all stakeholders. Therefore, the best approach would be to allow the government to frame the rules related to net neutrality post TRAI's recommendations. It is to be noted that DoT's Committee has already submitted its report on Net Neutrality, which includes issues related to OTT Communication Service Providers, and is waiting for TRAI's recommendations before taking any further steps regarding the issue.

2. TRAI, in its consultation paper, has outlined several approaches, such as cautious observation (not taking any specific measures), tentative refinement (a light-touch approach with some refinements to the existing regulatory framework) and active reforms (prohibiting specific behaviours by TSPs, most often subject to an exception for reasonable TMPs).

3. We believe that at this stage, the issues related to implementation, including infrastructure, should not be discussed till the policy has been finalized and is in place, since the implementation framework would be largely dependent on the policy framework. Therefore, the implementation of a net neutrality policy should be deliberated only once the principles of net neutrality and 'same service, same rules' have been defined.

Q.11 What could be the challenges in monitoring for violations of any NN framework? Please comment on the following or any other suggested mechanisms that may be used for such monitoring:
(a) Disclosures and information from TSPs;
(b) Collection of information from users (complaints, user-experience apps, surveys, questionnaires); or
(c) Collection of information from third parties and public domain (research studies, news articles, consumer advocacy reports).

Airtel's Response:

1. As mentioned above, we believe that the above issues should be deliberated upon only once the principles of net neutrality have been defined. At this stage, it would be premature to provide views on the monitoring aspects of a policy framework that is yet to be finalized.

2. Nevertheless, it would be appropriate to allow all stakeholders operating in the Internet service sector to follow a self-regulatory framework for adhering to Net Neutrality as and when the policy is announced. The Government and the Regulator can monitor such disclosures and seek information from relevant stakeholders in the event of any non-compliance. Since the level of information will vary from one case to another, it would be difficult to suggest a 'one size fits all' approach. We also do not recommend any ex-ante regulatory regime for Net Neutrality, especially when there has been no instance of blocking and throttling in the Indian telecom market.

Q.12 Can we consider adopting a collaborative mechanism, with representation from TSPs, content providers, consumer groups and other stakeholders, for managing the operational aspects of any NN framework?
(a) What should be its design and functions?
(b) What role should the Authority play in its functioning?

Airtel's Response:

1. As elaborated above, we recommend that the principles of net neutrality be applicable to all players operating in the Internet service sector rather than being limited to TSPs/ISPs alone.

2. We also believe that at this point of time, any deliberation on the design and function of the monitoring body for managing the operational aspects of net neutrality would be premature, since the legal and regulatory framework of net neutrality and 'same service, same rules' is yet to be defined.

Q.13 What mechanisms could be deployed so that the NN policy/regulatory framework may be updated on account of evolution of technology and use cases?

Airtel's Response:

1. Currently, there is no legal or regulatory framework pertaining to net neutrality. Therefore, we believe it would be premature to deliberate the issues related to updating such a framework.

2. Nevertheless, based on various market and technology developments, TRAI and the Government do regularly implement policy changes after holding discussions with all stakeholders. For this, a defined process has already been laid down (issuance of consultation paper, seeking inputs from all stakeholders, holding an open house, constituting Working Groups comprising people from the industry and the Government/TRAI, etc.) and the same process can be utilized for the Net Neutrality issue as well.

Q.14 The quality of Internet experienced by a user may also be impacted by factors such as the type of device, browser, operating system being used. How should these aspects be considered in the NN context? Please explain with reasons

Airtel's Response:

1. End-user access to Internet services is dependent not only on the network of TSPs/ISPs, but also on application providers and device manufacturers. For example, the quality of Internet services is dependent upon the type of device being used (3G/4G), the inbuilt restrictions on a device, the speed of the server providing the service, the type of hardware, browser, operating system and other software configured on the device. The QoS also depends upon the number of services that are running parallel on the user's device and the system configuration of the device being used. Harmful programs such as viruses and malware would also impair the user experience.

2. Similarly, throttling is not linked with TSPs alone, since it can happen at the content provider level as well. As mentioned earlier, Netflix[21] recently admitted that they were throttling their streaming speeds for the subscribers of AT&T and Verizon. In addition, throttling can also happen for several other reasons such as new IP ranges, incorrect routing by an international bandwidth provider, outages or overflows at caching/CDN, etc.

3. Furthermore, search neutrality[22], is a critical issue that requires due consideration. Today, a search engine works as a learning/research aid and also as a potential barrier to information retrieval on the Internet. The principles of net neutrality, such as transparency, throttling, no blocking, non-discrimination and reasonable management, should apply equally to search engines. Other issues, such as suppression, favouring or depreciation of search results, also require serious deliberation. Other nations are also bringing search engines under their legal framework. For example, the ruling of the European Commission in May 2014 can be noted in this context, according to which, it held that its 1995 Data Protection Directive applied to search engines too, and gave Internet users the right to seek the removal of their personal information from the digital space so that it would not turn up on search engines and social media platforms.

4. Other practices such as device control, preferential access, pre-burning (bloatware), default messaging apps (e.g., iMessage), and application stores, should also be considered by the Government and the Regulator. For instance, pre-loaded applications enjoy more large-scale adoption than other applications.

5. Net Neutrality is a multidimensional and complex topic and, therefore, requires careful consideration while formulating a policy. For example, apart from the issues mentioned above, the consultation paper is silent on 5G (where network slicing and prioritization is a core part of the protocol) as well as edge computing and caching; and any framework that does not address 5G-related issues will discourage TSPs from making investments in this technology. In fact, BEREC, in its recent guidelines on Net Neutrality, has explicitly permitted network slicing in 5G networks to aid the delivery of specialized services.

Therefore, a holistic approach is needed in the drafting and implementation of the Net Neutrality regulations, which will aim at providing regulatory certainty to all stakeholders, along with the much-needed flexibility that drives innovation and investments in broadband networks and leads to adequate returns on capital.

Airtel fully supports the principles of Net Neutrality being stated in this response, and we are ready to provide any further information needed on the subject and/or to meet the concerned officials in person in order to provide further clarity on the response.

[21] https://www.cnet.com/news/netflix-admits-throttling-video-speeds-on-at-t-verizon/
[22] https://www.mygov.in/sites/default/files/master_image/Net_Neutrality_Committee_report.pdf