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Shri A. Robert J. Ravi
Advisor (QOS)
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi - 110 002

Subject: Consultation Paper [No. 2/2015 dated March 27, 2015] on 'Regulatory Framework for Over-the-top (OTT) services'

Dear Sir,

This is with reference to the captioned Consultation Paper [No. 2/2015] released by Hon'ble Authority on March 27, 2015.

AT&T Global Network Services India Private Limited ("AT&T") would like to respectfully submit its comments in support of the captioned consultation (enclosed as Annexure – I).

AT&T in India is licensed to provide National Long Distance (NLD), International Long Distance (ILD) and Internet Service Provider (ISP) services in India and began providing these services in 2007 and 2009 respectively.

We trust you will find our submissions in order.

Thanking you,

Respectfully submitted,
for **AT&T Global Network Services India Private Limited**

Naveen Tandon
Authorised Signatory

Encl.: As above

Comments of AT&T: TRAI Consultation Paper on Regulatory Framework for Over-the-Top (OTT) Services, Consultation Paper No. 2/2015, March 27, 2015

Introduction and Summary

AT&T Global Network Services India Private Limited (“AT&T”) respectfully submits these comments on the TRAI Consultation Paper on the Regulatory Framework for Over-the-top (OTT) Services, issued on March 27, 2015 (the “Consultation Paper”).

AT&T is a subsidiary of AT&T Inc., which, through its affiliates, operates one of the world’s most advanced global backbone networks, provides services to virtually every country and territory in the world, and is a leading U.S. provider of international business and consumer communications services on the U.S.-India route. AT&T is licensed to provide National Long Distance (NLD), International Long Distance (ILD) and Internet Service Provider (ISP) services in India, and began providing these services in 2007 and 2009 respectively.

AT&T appreciates the opportunity to express its views in this consultation. AT&T hopes that its responses will be helpful to the Authority in formulating a comprehensive strategy for the sustainable development of the Internet in India, and among India and the globally interconnected Internet networks, allowing market participants to fully invest and innovate in the infrastructures and services which will benefit both consumers and businesses.

Information and communications technology (ICT) is already a critical driver of economic growth in both developed and developing countries. The further deployment of broadband technologies promises to multiply these benefits by leading to the creation of innovative services that are key economic drivers in themselves, and also enhance the benefits of investments in other industries and institutions – such as by carrying the cross-border data flows that fuel India’s business-process outsourcing sector, enabling transportation systems to run more smoothly, delivering new efficiencies to electric grids, expanding access to health care, providing new work options that allow reduced travel and emissions, connecting students to expanded educational resources, and bringing increased effectiveness to government.

To deliver these results, governments and regulators should continue the investment-friendly policies that have brought the vast expansion of network facilities and new services throughout the world, and allowed this critically important global communications medium to flourish and benefit the global community in ways that would have been unimaginable twenty years ago. Prominent among these beneficial policies that should be maintained to achieve this

goal is the policy objective to refrain from intrusive regulation of the Internet and associated service arrangements.

For several years now, AT&T has endorsed the policy and principles of an open Internet, which to us means an entire Internet ecosystem that enables users to exchange ideas and communicate freely, gives them freedom to access the lawful applications and content they wish to use, and affords them the ability to choose and assemble packages of services and equipment that meet their needs. To create an open Internet, AT&T Inc. has invested over \$140 billion over the past six years in our fixed and mobile broadband network and services when capital and spectrum-driven acquisitions are combined, and we have innovated in the intelligent network design to enable the growth of over 100,000% in data traffic on the AT&T network from January 2007 through December 2014, while improving network quality of service. This fundamental commitment to investment and network improvement has been replicated by carriers all over the world. When supporting an open Internet, AT&T is guided by the following core standards in addressing the needs of our customers in approaching new Internet-related business opportunities, designing new services, and managing our network:

- **Freedom** – Consumers should be able to openly exchange ideas, content, and information across the Internet.
- **Innovation** – Consumers are entitled to a robust and secure network that enables new services, applications, and devices.
- **Competition** – Consumers have the power to choose the best possible services and innovations.
- **Transparency** – Consumers should have clear and concise information about speed, cost, and traffic management

In less than two decades, the Internet has evolved dramatically from being a network that provided only file downloads and remote access to distant academic or government computers, to being a vibrant global commercial network that now provides countless different services to millions of content and applications providers and billions of users. During the past decade alone, during a time when proponents of strict net neutrality regulation have raised dire warnings about the risk of broadband Internet access providers limiting choice and access, such Internet access providers instead have poured more than a trillion dollars into next-generation networks capable of providing advanced services. In just the last decade alone, that network investment has paved the way for an entire Internet ecosystem that successfully a previously unimaginable

diversity and volume of content, applications, and services delivered over these advanced networks. Further dynamic advances will continue to occur in response to future technological change and consumer demand, spurred on by new developments, including the Internet of Things, Software Defined Networks, and Big Data Analytics.

The Internet also has become the most powerful communications medium and engine for economic growth ever, and has achieved this unprecedented growth without prescriptive regulation of the Internet that would have locked in place certain specific technologies or business models. In considering any Internet regulation to be adopted in the future, policy-makers should optimize not only the policy of Internet openness, but also the need to maintain incentives for Internet service providers to continue investing and innovating in the rapidly evolving advanced networks that must keep pace with the diversity and volume of new services. To the extent that any regulatory intervention is found to be necessary to protect the open Internet, it can be effective if appropriately targeted and limited to the adoption of meaningful transparency requirements, and the prohibition of blocking, degrading or otherwise unreasonably disfavoring some Internet traffic over other Internet traffic. Such open Internet guidelines are precisely tailored to prohibit any practices that could pose a threat to the “virtuous circle” of investment and innovation that has enabled the Internet to thrive. AT&T also does not oppose rules that restrict non-user-directed paid prioritization. However, there should be no restriction on user-driven prioritization, which can enhance consumer welfare and should be permissible. Beyond these core priorities to preserve an open Internet, any more invasive and prescriptive open Internet regulation is unnecessary and would reduce investment incentives for all operators that build and maintain the Internet networks.

More invasive regulation of commercial and operational practices also would cause significant difficulties if it was applied to mobile broadband access services, which comprise the large majority of Internet access services in many countries, including India. The rapid growth in mobile broadband usage and the fact that mobile subscribers move means that providers must grapple with variable and unpredictable network demand, requiring them to make difficult judgments about how to manage their networks in response to complex and fast-changing congestion problems. These issues have forced providers to develop innovative approaches to network management that must evolve quickly as new challenges arise. Subjecting those decisions to the full range of open Internet regulations, subject to an exception for “reasonable

network management,” would result in significant regulatory uncertainty that would slow down network-management decisions and inhibit investment. In light of the massive growth and evolution of the entire mobile Internet ecosystem, and given the absence of credible argument that there is an Open Internet market failure that must be remedied, there is no reason for any intrusive regulation of mobile networks to protect the Open Internet. In addition, just as other jurisdictions have recognized the merit for keeping enterprise service offerings and specialized services such as virtual private networks outside the scope of open Internet rules, India also should not prescriptively regulate these services.

1. Extensive Internet Regulation Is Unnecessary and Would Likely Harm Investment and Innovation

For at least a decade, advocates of applying strong net neutrality regulation solely upon broadband Internet access providers have raised concerns about the incentives and abilities of the broadband Internet access providers to stifle the “open Internet.”¹ The facts have not supported the claims or predictions of a marketplace failure. Today’s Internet is open, dynamic and thriving, and the goal of regulators should be preserving the balanced policy environment that has enabled this dynamic investment and innovation by all parties. Evidence that the Internet ecosystem is flourishing is abundant. Broadband access and speeds continue to increase, edge providers are flourishing – for example, the number of global over-the-top mobile VoIP subscribers increased by 550 percent in 2012² – and the use of social media applications has continued to explode. The Internet is also flourishing in India. India has the third largest number of Internet users after the United States and China, is reportedly the fastest growing major market for Google,³ and has the second-largest number of Facebook users after the United

¹ See, e.g., Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* 176 (2001).

² Press Release, Infonetics Research, *Infonetics Research Raises VoLTE Forecast; Over-the-top Mobile VoIP Subscribers Nearing 1 Billion Mark*, July 8, 2013, <http://www.infonetics.com/pr/2013/Mobile-VoIP-Services-and-Subscribers-Market-Highlights.asp>.

³ See <http://forbesindia.com/article/real-issue/is-google-gobbling-up-the-indian-internet-space/35641/0>

States.⁴ Additionally, millions of people in India are now accessing the Internet through the zero-rating program of Internet.org.⁵ Importantly, the Internet has remained open, and the “virtuous circle” of investment and innovation throughout the Internet ecosystem has flourished, without the overly intrusive, top-down rules that many advocates of strong net neutrality regulation claim are essential. Indeed, for most of the Internet’s existence, including the recent years when claims of imminent risk have been the loudest, openness has been achieved without any regulatory intervention at all.

Without compelling evidence of net neutrality violations or meaningful harm to the open Internet, there is no justification for extensive Internet regulation. There is, however, a significant risk that prescriptive government regulation entails significant social costs. Those well-documented costs, moreover, increase exponentially when the government attempts to regulate a technologically evolving field like the Internet, including the costs arising from a reduction in network investment or innovative network management efforts. Indeed, the risk that regulatory controls will be unable to keep up with dynamic and fast-moving changes is substantial. Given the well-understood costs of excessive regulation, as a general rule regulatory intervention is appropriate when—and only when—there is a concrete need for such intervention and regulators have enough information to appropriately balance the costs against the benefits.

Those who seek extensive new regulation of Internet access providers purport to justify these proposals, not with real-world evidence of a marketplace failure or a regulatory deficiency, but with speculation about purely theoretical incentives and abilities that broadband Internet access providers supposedly could have to engage in practices that might threaten the open Internet. Such speculation ignores the countervailing incentives that broadband Internet access providers have to maximize the value of their service to both end users and edge providers by offering end users what they want—namely, unfettered access to all safe and lawful Internet content, applications, and services, while being protected from cybersecurity risks. Indeed,

⁴ See <http://www.statista.com/statistics/268136/top-15-countries-based-on-number-of-facebook-users/> (showing India with 108.9 million users and the United States with 151.8 million users in May 2014);

⁵ <http://www.hindustantimes.com/technology-topstories/facebook-ceo-mark-zuckerberg-to-ht-net-neutrality-and-universal-connectivity-must-co-exist/article1-1337766.aspx>

broadband Internet access providers not only have incentives to offer such unfettered access, but also to encourage, support, and nurture innovation on their platforms. By doing so, these providers make those platforms more valuable to end users, enabling the providers to reap far greater economic benefits over time.

Considerable economic research supports this common-sense notion. A broadband platform provider has strong and rational market-driven incentives to deal evenhandedly with independent application providers, because to behave otherwise would ultimately decrease, not increase, the value of its platform.⁶ That incentive to maximize access to Internet content, applications, and services that consumers want would, exists even if the market for broadband Internet access were uncompetitive. But where competition in the marketplace is fierce, such competition further propels providers to offer access to content and applications that consumers desire. Indeed, any broadband Internet access provider that prevents innovative new content and applications from using its platform would inflict considerable harm on itself because most consumers could switch to a different provider that does not engage in such self-defeating behavior.

The technical capabilities of broadband Internet access providers are also sometimes misconstrued by proponents of strong net neutrality regulation. In particular, the assumption that providers have the ability to engage in end-to-end prioritization of Internet traffic is incorrect in the vast majority of cases. To engage in prioritization across connecting networks, it would be necessary to have a system coordinated among edge providers, backbone providers, and ISPs to mark certain packets for priority and to handle them accordingly. No such system exists today.

2. Regulators Should Recognize the Unique Operational Constraints Facing Mobile Broadband Providers

Prescriptive regulation of mobile broadband services would cause significant difficulties to mobile network operations. Mobile operators must contend with mobility, spectrum constraints, interference, and other unique issues in a dynamic environment that is changing even more rapidly than its wireline counterpart. To give a sense of how rapidly the mobile broadband

⁶ See, e.g., Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 *Harv. J.L. & Tech.* 85, 104 (2003); Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 *Geo. L.J.* 1847, 1888-89 (2006).

environment is evolving, in just the past decade, the AT&T Inc. operations in the U.S. have deployed 2G, 3G and 4G LTE platforms, and have experienced over 100,000% growth of data traffic on our network platforms. While it is impossible to predict which business models and engineering solutions will best meet consumers' diverse needs in this environment, subjecting the mobile industry to restrictions on network management would preclude many service-enhancing business arrangements and practices altogether, undermine efforts to manage scarce spectrum resources, chill sensitive engineering and business decisions through endless regulatory second-guessing or pre-emptive fear of enforcement, and deter investment and innovation in new network technologies. Indeed, many 5G mobile capabilities for efficiently and sensibly managing the diverse traffic on mobile networks could be prohibited by strict net neutrality rules.

While all broadband networks share the need for traffic management, given the ever rising demand for and proliferation of new quality-sensitive, bandwidth-intensive applications, mobile broadband networks also must contend with spectrum constraints, a shared "last mile" radio access network, interference sensitivity, and other concerns that make it far more challenging to provide mobile broadband than even fixed wireline broadband. Capacity and quality-of-service challenges for wireless broadband providers are particularly acute in the "last mile" radio access network, where spectrum is shared among both users and cell sites; bandwidth can fluctuate based on weather, interference and other issues; the number of users located in particular cells and their dispersion within those cells at any given time is variable; and the spectrum available for use is not infinitely (or even readily) expandable.

These factors make it exceedingly difficult for carriers to ensure a constant supply of sufficient bandwidth to provide high-quality data transmission for broadband Internet access customers. Providers therefore use a range of dynamic network-management techniques to respond to or avert network failures or severe congestion and to ensure that customers can enjoy latency sensitive applications. Mobile broadband providers thus face unique operational challenges that warrant different regulatory treatment.

3. Net Neutrality Policy Goals May Be Addressed By Limited Safeguards

AT&T has endorsed the principles of an open Internet for several years now. To provide consumer confidence in the protection of these principles, AT&T believes that Internet regulation of broadband Internet access providers should be limited to requiring transparency, "no blocking," preventing "commercially unreasonable" differentiation in the transmission of

lawful traffic; and restricting non-user-directed paid prioritization. These safeguards require broadband Internet access providers to provide transparent information regarding the network management practices, performance, and commercial terms of their broadband Internet access services. These safeguards require fixed broadband Internet access providers not to block lawful content, applications, services, or non-harmful devices, subject to reasonable network management. They would require mobile broadband Internet access providers not to block access to lawful websites, or applications that compete with the provider's voice or video telephony services, also subject to reasonable network management. The safeguards also require broadband Internet access providers not to engage in "commercially unreasonable" differentiation in the transmission of lawful traffic over a consumer's fixed broadband Internet access service.

An additional safeguard that could be provided is to precisely target the practices that net neutrality advocates fear could undermine an open Internet, by prohibiting non-user-directed "paid prioritization."⁷ Non-user-directed arrangements have been a concern for net neutrality advocates, who have expressed concerns that such paid prioritization will lead to a bifurcated Internet, with "fast lanes" for some content and inadequately "slow lanes" for other content. However, as described below, there should be no restriction on user-driven prioritization, which can enhance consumer welfare and should be permissible.

There are many reasons why an end user might want to direct certain types of prioritization or subsidization, and rational Internet regulations should preserve such consumer choice and flexibility. For example, even net neutrality advocates have recognized that services that allow customers to designate certain traffic for prioritization, have been used for years without any threat or harm to the open Internet, provide benefits to customers and should not be restricted. Customers use such services to make the Internet work better for their own needs,

⁷ These advocates are not concerned with all commercial prioritization arrangements; rather, their chief concern is paid prioritization arrangements with edge providers that are invisible to, and not directed by, the end users over whose Internet connection packets are being prioritized. Consistent with that concern, the term "paid prioritization" is used here to mean commercial arrangements in which an edge provider pays an Internet service provider to prioritize the edge provider's traffic as it is delivered over a consumer's fixed broadband Internet access service, where such prioritization is not at the direction of the consumer. "Paid prioritization" is thus distinct from user-driven prioritization.

such as by prioritizing latency- and jitter-sensitive VoIP packets or video conference packets over ordinary web browsing packets. There is no conceivable reason that such services, demanded and used widely by business customers today, should be foreclosed by regulatory fiat.

Consumers could benefit from other forms of user-directed prioritization as well. Such prioritization, for example, could facilitate life-saving telehealth services, particularly for consumers in rural areas. It might also be important to enable certain online educational services or to facilitate commerce more generally. In addition, end users who have a greater need for high-definition video conferencing might want the ability to direct their broadband Internet access providers to prioritize accordingly.

Importantly, such user-directed differentiation of Internet traffic is not foreign to the Internet, but instead was built into the Internet's DNA. Since the early days of the Internet, engineers have recognized a need to build intelligence into the Internet Protocol to enable networks to distinguish among packets on the basis of their associated applications. They recognized that different applications would have different needs but that those needs could be addressed in part by dividing applications into different handling classes within an IP network. For example, the original standards "treat[ed] high precedence traffic as more important than other traffic" and defined informational flags for prioritization of packets traveling on Transmission Control Protocol/IP networks.⁸ The standards document outlined the process for automatically enforcing one of several separately defined policies, including minimizing delays in transmission, maximizing throughput, and increasing reliability.⁹

Although much of the traffic on the Internet in the early days was not particularly sensitive to latency and jitter and thus did not need to exploit these differentiation capabilities, designers intended for the Internet to evolve to support new applications and services that would

⁸ Information Sciences Institute, Request for Comment (RFC) 791: Internet Protocol DARPA Internet Program Protocol Specification (Jon Postel ed., 1981), available at <http://www.ietf.org/rfc/rfc791.txt>.

⁹ Internet Assigned Numbers Authority (IANA), IP Option Numbers, <http://www.iana.org/assignments/ip-parameters> (last visited July 2, 2014). Subsequent standards documents expanded the traffic filtering and prioritization system. See Steven Blake et al., IETF Network Working Group, RFC 2475: *An Architecture for Differentiated Services* (1998), available at <http://www.ietf.org/rfc/rfc2475.txt>; Kathleen Nichols et al., IETF Network Working Group, RFC 2474: *Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers* (1998), available at <http://www.ietf.org/rfc/rfc2474.txt>.

require differentiated treatment. In fact, the Internet Assigned Numbers Authority (IANA), the body that administers common numeric value standards, still describes the standard type-of-service values as ways to enforce different standards for different types of content. The IANA suggests “[g]enerally, protocols which are involved in direct interaction with a human should select low delay, while data transfers which may involve large blocks of data . . . need high throughput.”¹⁰ Preserving the ability of consumers to direct prioritization is thus entirely in keeping with the Open Internet’s history and structure.

Paid prioritization has been far more controversial than user-driven prioritization. Even though to AT&T’s knowledge a paid prioritization service has never been offered, net neutrality advocates express concern that, if offered, paid prioritization could lead to a bifurcated Internet with “fast lanes” and unworkably “slow lanes.” AT&T believes that these concerns are vastly overstated, but does not oppose rules that are designed to prevent such behavior. Such a prohibition would prohibit providers from engaging in paid prioritization of traffic over mass-market fixed broadband Internet access service where such prioritization is not authorized by end users. User-directed prioritization, as distinct from paid prioritization arrangements, would remain permissible.

Contrary to the claims by some net neutrality advocates, sponsored data and zero-rating plans should not be confused with paid prioritization arrangements, and pose no credible threat to the open Internet. Sponsored data and zero-rating plans do not undermine an open Internet or create Internet “fast-lanes” but rather promote Internet openness by encouraging consumers to explore mobile online applications and content that they might otherwise not use. Sponsored data and zero-rating plans therefore can benefit content providers and consumers in the same way that toll-free calling and free shipping do. Far from erecting a barrier to entry for new edge providers, the sponsored data and zero rated plans offer new providers a scalable and flexible tool that they can use to drive interest and engagement with their content and provide a cost-effective way to expand their customer base. Further, these plans can play a vital role in mitigating the digital divide in societies, creating affordable opportunities for lower income consumers to experience broadband services. Such digital inclusion advances sustainable development goals, and have the potential to bring people to the open Internet, rather than to

¹⁰ Internet Assigned Numbers Authority (IANA), IP Option Numbers, <http://www.iana.org/assignments/ip-parameters> (last visited July 2, 2014).

pose a credible risk to the open Internet. These plans are the type of innovative service offering benefiting consumers and new entrant content providers that regulators should welcome in a competitive, innovative marketplace.

Once the perceived risks of non-user-directed paid prioritization are mitigated, there is no reason to adopt more extensive or prescriptive safeguards. The Internet has remained open without any prescriptive regulation, and by adopting limited safeguards requiring transparency, “no blocking,” preventing “commercially unreasonable” differentiation in the transmission of lawful traffic; and restricting non-user-directed paid prioritization, regulators will have laid the proper foundation going forward for broadband Internet access providers to continue to invest and innovate in the Internet, so it continues its astonishing contributions to economic, cultural, political, and social health. In contrast, upsetting the balance with stricter Internet regulation solely upon the broadband Internet access providers, would be fundamentally at odds with the facts on the ground, and would chill investment and innovation in unintended ways.

Regulators also should continue to exempt enterprise services from any open Internet rules. Enterprise services, also sometimes called specialized services or business services, are typically offered to larger organizations through customized or individually negotiated arrangements. An example of such a service would be virtual private networks. Various jurisdictions that have reviewed open Internet policies have proposed to exempt such enterprise or specialized services from open Internet rules. In the United States, for example, both the FCC’s open Internet rules adopted in 2010 and the additional regulation adopted by the FCC in 2015 apply only to mass-market retail broadband Internet access service, with the capability to transmit and receive data from all or substantially all Internet end-points.¹¹ This definition for the scope of the open Internet rules excludes enterprise service offerings and specialized services such as virtual private networks.¹²

Other regulators should also avoid imposing net neutrality regulation on these enterprise or specialized services. AT&T and other telecommunications and Internet providers throughout

¹¹ See FCC, *Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Report and Order On Demand, Declaratory Ruling and Order, rel. March 12, 2015 (“*FCC 2015 Internet Order*”), ¶¶ 186-187; FCC, *Preserving the Open Internet*, 25 FCC. Rcd. 17905, ¶ 44 (2010) (“*FCC 2010 Internet Order*”).

¹² See *FCC 2015 Internet Order*, ¶ 190; *FCC 2010 Internet Order*, ¶ 47.

the world have long provided IP-based services to enterprise business customers. These services include enterprise-grade Internet access and Internet Protocol services, with the capability to prioritize packets associated with performance-sensitive applications. This is provided to a wide range of customers, including healthcare providers, community service organizations, restaurant chains, car dealers, electric utilities, banks, municipalities, security/alarm companies, hotels, labor unions, charities, and video-relay service providers. And the market of services that merit different network performance requirements is expanding with Smart Grid, healthcare, emergency-response, and a variety of other services that may involve or require packet prioritization capabilities. These services are pro-consumer, and indispensable to key social objectives. Just as other jurisdictions have recognized the merit for keeping these services outside the scope of open Internet rules, India also should not prescriptively regulate these services.

4. Internet Traffic Compensation Regulations Would Harm Users and Limit Connectivity

The marketplace for Internet traffic exchange is an unmitigated success story. Edge providers and other IP networks, regardless of their network size or scope, have choices to peer with other providers of similar size and scope, or to purchase transit or on-net-only connectivity from a variety of other providers. In fact, this market is more dynamic and competitive than ever before. Proposals to replace current commercially-negotiated Internet traffic arrangements with regulated interconnection arrangements would significantly harm rather than assist the future development of the Internet. They would likely suppress Internet traffic flows and investment incentives, reduce connectivity to countries adopting such regulation, and require destination-specific pricing for consumer Internet usage that would radically change the current user Internet experience.

What is commonly referred to as “the Internet” is actually a loose confederation of thousands upon thousands of IP networks. These networks exchange IP packets with each other on the basis of unregulated private agreements. For more than two decades, such interconnection has taken the form of “transit” and “peering” agreements, and in recent years, “on-net-only” agreements have arisen in response to growing demands for video and other forms of media-rich content. Under a transit agreement, Network X becomes a customer of Network Y and pays it to arrange delivery of Network X’s packets to any destination on the Internet and to accept delivery of packets destined for Network X’s customers from any location on the Internet. By contrast,

under a peering agreement, two networks sharing similar characteristics interconnect for the purpose of exchanging packets sent from customers served by one peer to customers served by the other peer. On-net-only arrangements represent a third category that some parties refer to as “paid peering.” Under these arrangements, one network pays the other. But unlike in a transit arrangement, the networks interconnect to exchange traffic only among their respective customers; they do not exchange traffic destined for other points on the Internet.

Importantly, since the inception of the commercial Internet, peering arrangements generally have been premised on the assumption that, among other things, the traffic exchanged between the two networks will be roughly balanced, such that each network will incur roughly the same costs in handling the traffic originated by the other network. To avoid administrative overhead, parties to these bilateral peering agreements typically forgo the mutual exchange of compensation and peer on a settlement-free basis. But in some cases, where the traffic volumes exchanged have become unequal, or where one network no longer meets each element of the other’s relevant peering criteria, there is no longer a basis for this type of barter transaction. In these circumstances, the parties may enter into an arrangement where one party pays the other to compensate for the imbalance of network infrastructure usage.

These private commercial agreements have always been unregulated, yet the marketplace for peering and transit services has functioned with extraordinary efficiency. Because larger IP networks compete vigorously for the transit business of smaller ones, and because there are many alternatives to transit, prices for transit service have plummeted dramatically over the past decade and a half—from approximately \$1200/Mbps in 1998, to approximately \$5/Mbps in 2010, to less than \$1/Mbps today.¹³ Competition in the transit market is fueled by massive continuing investments in fiber and IP platforms by ISPs and others, as well as the wide availability of peering. The facts concerning increasing investment, increasing capacity, and decreasing price per Mbps, show that this is a market success and not a market failure.

There is no plausible basis for concern that traffic exchanges between IP networks will be any less efficient in the future, or remotely in need of prescriptive regulation. As described above, the web of relationships among IP networks and the robust market for transmission

¹³ DrPeering International, *Internet Transit Prices (1998-2014) U.S. Internet Region* (last updated Aug. 2010), <http://drpeering.net/white-papers/Internet-Transit-Pricing-Historical-And-Projected.php>.

alternatives ensures that there are many efficient paths through which Internet traffic can reach an ISP's customers. In short, the multiplicity of alternative routes into a given ISP's network, combined with the web of Internet interconnection arrangements among CDNs and other networks, deprives any ISP of the ability to coerce inefficiently high payments from any other IP network.¹⁴

Proposals to regulate Internet traffic arrangements would likely suppress traffic flows and investment incentives, reduce connectivity, and could require destination-specific pricing for consumer Internet usage that would radically change the current user Internet experience. The result would be complete economic and technical regulation of operator rates, terms, conditions, and quality of service, and a significant reduction in the dynamism and growth of the Internet.

One area for TRAI to carefully understand, with respect to Internet interconnection, is the delivery of video traffic. Video is the fastest growing type of traffic on broadband networks, and will be an increasing priority in India, with the availability of more fixed and mobile broadband over time. In this respect, AT&T's experience in the U.S. with the video provider Netflix may be instructive when considering policy in India.

Netflix and its business partners (Cogent and Level 3) take the flawed "terminating monopoly" argument a step further. Not only do they argue that ISPs' peering and transit agreements should be regulated, but they also claim that ISPs should be barred from charging *anything* when they interconnect with other IP networks, regardless of whether that exchange of traffic is equal or massively imbalanced. There is absolutely no legitimate policy rationale for such a fundamental change to the way that IP traffic exchange has always been handled. To the contrary, permitting Netflix to shift all of its transit costs to ISPs and their broadband customers would be bad for consumers and would inflict serious harm throughout the Internet ecosystem.

¹⁴ However, other authorities are examining whether there are dominant bottlenecks that can be abused in a variety of areas of the Internet value chain. See European Commission, Press Release, *Antitrust: Commission sends Statement of Objections to Google on comparison shopping service; opens separate formal investigation on Android*, Apr. 15, 2015, http://europa.eu/rapid/press-release_IP-15-4780_en.htm.

Content providers like Netflix have *always* paid other IP networks to handle the delivery of their content, and up until recently, this would not have been entertained as an “open Internet” issue. Because they generate far more traffic than they receive, they have always entered into transit arrangements with backbone providers and arrangements with content-delivery networks that interconnect with ISPs. And Netflix is an extreme case. By some estimates streaming video from Netflix accounts for *more than a third* of the download traffic on the Internet during peak times.¹⁵ Traditionally, Netflix did not interconnect directly with ISPs; instead, it paid CDNs and transit providers such as Cogent and Level 3 to transport traffic on its behalf. But in recent months, Netflix has sought interconnection agreements directly with larger ISPs.¹⁶ And despite complaining that it should not be required to pay *anything* for such interconnection, it now pays less under these direct arrangements than it would for comparable service on the open market for transit and CDN services.¹⁷

Netflix’s current business partners, in turn, have bilateral agreements with ISPs. And in many cases, they traditionally have peered with ISPs on a settlement-free basis. However, under the marketplace norms that have prevailed for more than two decades, such “free” peering is in fact a barter transaction predicated on both IP networks having comparable infrastructure and exchanging traffic on a roughly equal basis. And the tsunami of traffic flowing from Netflix over its few selected transit providers has created substantial congestion at the interconnection points with ISPs, because these transit providers have flooded their peering links to levels well beyond those anticipated by their peering arrangements with ISPs.¹⁸ Netflix has refused to adjust

¹⁵ See Drew Fitzgerald, *Netflix’s Share of Internet Traffic Grows*, The Wall Street J. (May 14, 2014), <http://online.wsj.com/news/articles/SB10001424052702304908304579561802483718502>.

¹⁶ See, e.g., Drew Fitzgerald, *Netflix Reaches Interconnection Deal with Verizon*, The Wall Street J. (April 28, 2014), <http://online.wsj.com/news/articles/SB10001424052702304163604579530321917846620>.

¹⁷ See Dan Rayburn, *Here’s how the Comcast & Netflix Deal is Structured, With Data & Numbers*, Streaming Media (Feb. 27, 2014), <http://blog.streamingmedia.com/2014/02/heres-comcast-netflix-deal-structured-numbers.html>.

¹⁸ See Marguerite Reardon, *Comcast vs Netflix: Is this really about Net Neutrality?*, Cnet (May 15, 2014), <http://www.cnet.com/news/comcast-vs-netflix-is-this-really-about-net-neutrality/> (“Netflix is attaching a fire hose to the Comcast network, which is only equipped to

its traffic-routing practices to make use of other transit providers and content-delivery networks whose facilities could bear the load.¹⁹ And both Netflix and its transit providers have balked at entering into the type of on-net-only relationships with ISPs that that marketplace has always offered in such circumstances.²⁰ Instead, Netflix and its business partners have adopted the novel approach of blaming the congestion on ISPs and demanding that those ISPs interconnect with them for free, in direct contravention to the barter basis for peering. In short, Netflix hopes to upend decades of standard industry practice by forcing ISPs, through wholly unnecessary and harmful regulations, to bear the full costs of such lopsided traffic.²¹

Accepting Netflix's type of demand would be bad for consumers, bad for the Internet ecosystem, and bad for India. If ISPs are forced to bear alone the very real costs imposed by Netflix's traffic (or that of companies with similar business models), they will pass those costs

handle connections the size of garden hoses. The gushing fire hose of content can't possibly be funneled into the few garden hose ports that are available.").

¹⁹ See Dan Rayburn, *Netflix & Level 3 Only Telling Half the Story, Won't Detail What Changes They Want To Net Neutrality*, Streaming Media (March 21, 2014), <http://blog.streamingmedia.com/2014/03/netflix-level-3-telling-half-story-wont-detail-changes-want-net-neutrality.html> ("Saturating a peering point can easily be prevented if you buy transit from multiple providers, which Netflix does. But the reason Cogent is the one transit provider we always seem to hear about is because Netflix continued to push their traffic through Cogent even though they knew it was already congested. Even though Netflix was buying transit from multiple providers, it wasn't routing around capacity issues, like all the other CDNs do.").

²⁰ See Marguerite Reardon, *Comcast vs Netflix: Is this really about Net Neutrality?*, Cnet (May 15, 2014), <http://www.cnet.com/news/comcast-vs-netflix-is-this-really-about-net-neutrality/> ("Netflix could fix this problem in one of two ways. It could pay for a fire hose connection instead of taking the garden hose connection that it can get through a standard peering relationship with Comcast. The large connection would accommodate the Netflix traffic. The other option is to distribute its traffic more evenly among other CDNs that are delivering traffic to Comcast. In this case, the video traffic could get onto the Comcast network via the many garden hoses already connected to the Comcast network. Of course, in either instance this would cost Netflix more money. The company would either have to pay Comcast for more capacity or the company would have to pay CDNs more money to deliver its traffic. In either instance, the additional costs that Netflix would incur under either of these scenarios are not new. The company has always had to pay for the transit and delivery of its content.").

²¹ Although Netflix casts this as an industry-wide issue, other video providers (and their business partners) do not raise similar concerns.

down to their customers, at least 60 percent of whom are not Netflix customers.²² Effectively, *all* broadband Internet access customers would be forced to subsidize Netflix's service, even though nearly two thirds of them do not subscribe to it. There is no conceivable policy justification for forcing countless low-volume Internet users to pay more for their broadband service so that Netflix can avoid paying its fair share of the substantial costs that it imposes on the IP networks that transport its traffic.

Finally, fundamentally altering how ISPs exchange traffic with other IP networks would upend the well-functioning marketplace for peering and transit. Regulators would be forced to draw arbitrary lines concerning who is entitled to free interconnection and who must pay for it, and under what circumstances. To do so, regulators would need to craft rules that balanced a multitude of factors that could be relevant to such a line-drawing exercise, including: the locations where traffic may be exchanged between networks free of charge, the type of ISP terminating the traffic (e.g., mobile, wireline, fixed wireless), the type of interconnecting provider (e.g., content provider, CDN, backbone provider), the type of end user (e.g., consumer, small business, enterprise), and many other variables. But the marketplace is already accounting for such factors with extraordinary efficiency today without prescriptive rules. In short, regulators should not introduce chaos into a system that has for decades facilitated the incredible growth and dynamism of the Internet merely to further the business interests of a single edge provider that is trying to game the system.

5. **Regulators Should Refrain from Unnecessary Regulation, But Where Regulation is Necessary, Should Apply Policies Evenly To Similar Services To Protect Consumer Interests**

²² See, e.g., Netflix, *2014 Quarterly Earnings Q2 14 Letter to Shareholders* at 1 (July 21, 2014), http://files.shareholder.com/downloads/NFLX/3457584414x0x769748/9b21df7f-743c-4f0f-94da-9f13e384a3d2/July2014EarningsLetter_7.21.14_final.pdf (stating that the company has 35.09 million domestic subscribers); Press Release, "Nearly 1.2 Million Add Broadband in the First quarter of 2014," Leichtman Research Group (May 20, 2014), <http://www.leichtmanresearch.com/press/052014release.html> (stating that there are 85,546,906 broadband subscribers in the United States). This figure almost certainly understates the actual percentage of broadband subscribers who do not use Netflix. It includes mobile customers in the numerator (Netflix subscribers) but not the denominator (wireline broadband subscribers), and it also includes within the numerator many Netflix "subscribers" who do not actually use the service but, for example, merely signed up for free trials.

Where the market is effectively addressing public policy priorities, both consumers and competition benefit by reducing legacy regulation of communications services.. In the United States, for example, for many years both mobile wireless services and broadband Internet access services have grown explosively and have generated enormous consumer benefits without substantial regulatory intervention. In contrast, where regulators have sought to impose regulatory obligations on next-generation services, they have stifled investment and harmed consumers. In India, for example, the current telecommunications licensing regime does not allow providers to take advantage of technological developments to offer innovative services such as the unrestricted VoIP services that are widely available other countries.

With the rapid convergence of services and platforms, asymmetric regulation of telecom licensees and OTT providers, can harm consumers by keeping telecommunications providers from competing vigorously and nimbly in the face of fast-changing consumer preferences, thus distorting the competitive landscape with no countervailing benefit.²³ The preferred approach to removing such regulatory asymmetries should be to remove unnecessary regulation of all providers, by recognizing where technology and market changes have removed the former dominance of telecommunications providers, and rules originally designed to prevent the abuse of market power no longer make sense. Thus regulatory modernization in the telecommunications sector should be part of the Authority's agenda, to allow service providers to have the flexibility to offer innovative services to consumers.

Consistent with these overall objectives, the general policy approach for OTT services and for telecom provider services should be to refrain from prescriptive regulation. But pending the adoption of reform that would provide a symmetrical set of obligations for all providers providing substitutable services based on light touch regulation, regulators could redress some of the current asymmetries with respect to economic, social and safety policies on a targeted, case-by-base basis. The objective should be to determine when to apply similar policies to similar


²³ See e.g., Howard Shelanski, *Adjusting Regulation to Competition: Toward a New Model for U.S. Telecommunications Policy*, 24 Yale J. Reg. 55, 93 (2007) (Regulation in non-monopolistic markets with a high ratio of fixed to marginal costs "is unlikely to improve pricing and may well interfere with competition. Advance tariff filing, for example, may help to stabilize high prices by removing the threat of surprise price cuts that benefit consumers and keep downward pressure on prices. Asymmetrically applied service standards and requirements may have similar effects.")

services, based on the approach that best protects consumer interests. Examples of areas where similar policies could be applied include universal service obligations (where similar services that compete should have similar obligations to fund universal service), law enforcement assistance, emergency service and disability access, (where similar public safety or security obligations also should apply to similar services). With regard to economic regulation, regulators should in general assess the need for rate or tariff regulation by considering all competition in the marketplace in light of all substitutable services. In many instances, such assessments should lead to regulators removing or reducing legacy regulation by recognizing the effects of technology and market changes and allowing telecommunications licensees additional flexibility as described above. Such policies will further stimulate competition and the associated benefits to consumers and the wider economy.

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AT&T would be pleased to answer any questions on these issues.

Respectfully submitted,
for AT&T Global Network Services India Private Limited


Naveen Tandon
Authorised Signatory

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