

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554**

In the Matter of

Restoring Internet Freedom

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) WC Docket No. 17-108
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TABLE OF CONTENTS

INTRODUCTION AND SUMMARY.....	i
I. THE FUNDAMENTAL PREMISE OF THE NPRM’S POLICY OBJECTIVE IS FLAWED: “THE INTERNET” AND THE INTERNET ECONOMY ARE MORE THAN JUST BROADBAND INTERNET ACCESS SERVICES, AND INVESTMENT IN THE OVERALL INTERNET ECONOMY HAS INCREASED WITH THE ADOPTION OF OPEN INTERNET PROTECTIONS.....	1
II. MICROSOFT’S OWN EXPERIENCES BEAR OUT THAT THE BRIGHT LINE RULES, THE TRANSPARENCY RULES AND THE GENERAL CONDUCT STANDARD ARE ALL STILL REQUIRED TO PROTECT AGAINST THE INCENTIVES OF FIXED AND MOBILE BROADBAND INTERNET ACCESS SERVICE PROVIDERS TO INTERFERE WITH TRAFFIC ON THEIR NETWORKS.....	10
III. THE COMMISSION SHOULD CONTINUE TO MONITOR ARRANGEMENTS REGARDING INTERCONNECTION AND THE EXCHANGE OF TRAFFIC WITH BROADBAND INTERNET ACCESS SERVICE PROVIDERS	21
CONCLUSION.....	22

INTRODUCTION AND SUMMARY

Microsoft calls on the Commission to maintain its commitment to an open internet. An open internet, and open internet rules, applicable to all fixed and mobile broadband internet access services, are critical to continued investment and innovation, not only in the networks of broadband internet access service providers, but across the full range of the internet economy.

Preservation of an open internet has been a critical issue for Microsoft since well before the term “net neutrality” gained popularity. Microsoft supported the High Tech Broadband Coalition’s Comments in the *Cable Modem* proceeding in June 2002, including the promotion of a set of “Connectivity Principles.”¹ Shortly thereafter, Craig Mundie, Microsoft’s Senior Vice President, Chief Technology Officer, Advanced Strategies and Policy, testified before the Senate Committee on Commerce, Science and Transportation that:

As users of the Internet and builders of the Internet age, we believe that our success and consumers’ enjoyment of the Internet has grown out of one fundamental feature – the ability of consumers to use their internet connections *without interference from network providers*. This freedom has made the Internet the powerful communications and technology tool that it is today, stimulating small business development and benefitting the entire economy. Freedom from interference from network operators has fostered tremendous gains in productivity and economic activity over the past decade. As this Committee and the FCC develop policies for next generation networks, now is not the time to abandon this fundamental feature.²

The buzzwords and the politics may have changed, but Mr. Mundie’s admonition is just as true today as it was fifteen years ago. The economic incentives of both wireline and wireless

¹ Comments of the High Tech Broadband Coalition, *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, CS Docket No. 02-52 (June 17, 2002).

² Letter from Scott Blake Harris, Counsel to Microsoft, to Marlene Dortch, Secretary, Federal Communications Commission, *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, GN Docket No. 00-185, *et. al.* (Oct. 18, 2002) (Emphasis added).

broadband internet access service providers to interfere with traffic on their networks is the same as it was fifteen years ago, and as they were 5 years ago, when the D.C. Circuit acknowledged them in the *Verizon* decision.³ The internet economy today is just as (if not more) mobile-first, cloud-first as it was three years ago, when Microsoft encouraged the Commission in the *Open Internet* proceeding to adopt strong open internet protections for both fixed and mobile broadband internet access services.⁴ Edge provider investment and innovation are just as dependent today on an open internet as they always have been. The same underlying economic incentives, the same market forces, the same potential harms should all compel the same conclusion: the Commission should maintain enforceable net neutrality rules. A robust, open internet that preserves consumer access to all lawful edge services is necessary to encourage innovation and maintain a strong and vibrant U.S. economy. Now is not the time for the Commission to abandon its protection of an open internet.

³ *Verizon v. FCC*, 740 F.3d 623 (D.C. Cir. 2014) (“Verizon”).

⁴ Comments of Microsoft Corporation, *Protecting and Promoting the Open Internet*, GN Docket No. 14-28 (July 18, 2014) (“Microsoft 2014 Comments”) at 12.

I. THE FUNDAMENTAL PREMISE OF THE NPRM’S POLICY OBJECTIVE IS FLAWED: “THE INTERNET” AND THE INTERNET ECONOMY ARE MORE THAN JUST BROADBAND INTERNET ACCESS SERVICES, AND INVESTMENT IN THE OVERALL INTERNET ECONOMY HAS INCREASED WITH THE ADOPTION OF OPEN INTERNET PROTECTIONS

The NPRM reflects a significant focus on the promotion of innovation and investment as the prevailing public policy objectives of the Commission in this proceeding.⁵ No one likely will dispute that innovation and investment in the internet economy are indeed critical public policy goals. The internet economy “both directly and indirectly benefits not only the daily lives of its millions of consumers, but also the overall health of the U.S. economy, specifically by increasing GDP, industry growth, employment, consumer surplus, and employment earnings.”⁶ The low barriers to entry, the low cost of global delivery, and the nearly limitless diversity of offerings in the marketplace ensures that everyone with an internet connection can have access to capabilities previously out of reach of many people and businesses.

This era of innovation has spawned new businesses and created opportunities for application and content developers around the world, while simultaneously benefitting the

⁵ Notice of Proposed Rulemaking, *In the Matter of Restoring Internet Freedom*, WC Docket No. 17-108 (May 23, 2017) (“NPRM”) ¶¶ 44-46, 49.

⁶ Stephen Siwek, *Measuring the U.S. Internet Sector* (2005) (“IA Internet Value Study”) at 5, available at <http://internetassociation.org/wp-content/uploads/2015/12/Internet-Association-Measuring-the-US-Internet-Sector-12-10-15.pdf>. Similar to the conclusion of the *IA Internet Value Study*, the Boston Consulting Group found: “The Internet economy in the developed markets of the G-20 will grow at an annual rate of 8 percent over the next five years, far outpacing just about every traditional economic sector, producing both wealth and jobs.” The Boston Consulting Group, *The Internet Economy in the G-20* (March 2012), available at <https://www.bcg.com/documents/file100409.pdf>. Other studies have shown similar significant economic contribution specifically from the cloud services component of the internet economy. See, e.g., Liebenau, et. al., *Modelling the Cloud* (Jan. 2012), available at <http://www.lse.ac.uk/businessAndConsultancy/LSEEnterprise/news/2012/cloud.aspx>; Deloitte, *Measuring the Economic Impact of Cloud Computing in Europe* (2016), available at <https://ec.europa.eu/digital-single-market/en/news/measuring-economic-impact-cloud-computing-europe> (“It is estimated that over the next five years, cloud computing could add a cumulative total revenue of EUR 449 billion to the EU28 GDP (including in the public sector). This will have a positive impact on job creation and employment: 1.6 million jobs could be created between 2008 and 2020. Also, it is expected that 303 000 new businesses, in particular SMEs, could be created between 2015 and 2020 through the development and deployment of cloud computing.”).

customers who rely on such offerings in their businesses and personal lives. Entrepreneurs no longer need access to significant sums of capital to reach millions of consumers, and customers no longer must spend unproductive time seeking solutions to their challenges and opportunities. Instead, novel ideas combined with little more than the ability to design and place an application on the internet can unleash innovation to the benefit of businesses, consumers and national economies. There is little doubt that consumer surplus and consumer welfare have benefitted tremendously from the internet economy, and the NPRM rightly points toward the continued promotion of innovation and investment in the internet economy as important public policy goals. The NPRM, however, falls short in its enunciation of those goals and the impact of the Commission’s open internet rules on the promotion of those goals.

In its discussion of innovation, the NPRM focuses on assertions that broadband internet access service provider investment decreased following the promulgation of the Commission’s 2015 open internet rules.⁷ In doing so, the NPRM gives short shrift to studies showing that, to the contrary, broadband internet access service provider investment and innovation has increased during periods of effective open internet protections.⁸ Other parties and studies have refuted the Commission’s claim that open internet protections depress broadband internet access service provider investment. Thus, “Internet Association research finds ISPs continue to invest and innovate at similar or greater levels in the current regulatory

⁷ See, e.g., NPRM ¶145.

⁸ Notwithstanding devoting three full paragraphs to claims of depressed investment by broadband internet access services providers, the NPRM grudgingly notes, “Other interested parties have come to different conclusions,” NPRM ¶ 25, with a footnote to a citation to the study by Free Press substantiating such “different conclusions.” Even then, without anywhere discussing potential flaws in the studies claiming depressed investment, the NRPM devotes more space in the footnote to challenging the Free Press study than acknowledging it. See *id.* n. 116.

environment, including after the 2015 Open Internet Order.”⁹ The NCTA also recently touted the fact that increased U.S. broadband speeds in the last five years—which include the time the Commission’s open internet rules have been in effect—are the “*result of constant innovation cycles* and aggressive deployment of new technologies across the country.”¹⁰ Verizon stated emphatically that the Commission’s open internet rules “do not influence the way we invest,”¹¹ and in May, MLex reported that “no ISP said in a securities filing this year that the 2015 FCC order had caused them to spend less on infrastructure.”¹² More recently, a group of small broadband internet access service providers confirmed, contrary to the discussion in the NPRM, that they “have encountered no new additional barriers to investment or deployment as a result of” the Commission’s open internet rules.¹³ Thus, one of the underlying precepts of the Commission’s efforts to roll back open internet protections is, at best, highly disputed.

More problematic, however, is the NPRM’s exclusive focus on the broadband internet access service provider corner of the internet economy. While robust broadband internet access networks are critical in allowing consumers to gain access to edge services, the internet

⁹ <https://netneutrality.internetassociation.org/facts/>.

¹⁰ John Brodtkin, *Broadband Speeds Have Soared Under Net Neutrality Rules* (June 12, 2017)(emphasis added), available at <https://arstechnica.com/information-technology/2017/06/broadband-speeds-have-soared-under-net-neutrality-rules-cable-lobby-says/>

¹¹ Jon Brodtkin, *Verizon Admits Utility Rules Won’t Harm FiOS and Wireless Investments* (Dec. 10, 2014), available at <https://arstechnica.com/business/2014/12/verizon-admits-utility-rules-wont-harm-fios-and-wireless-investments/>.

¹² Mike Swift and Xiumei Dong, *Net Neutrality’s Impact on Internet Capital Spending Not Clear* (May 17, 2017), available at <https://mlexmarketinsight.com/insights-center/editors-picks/Data-Protection-Privacy-and-Security/north-america/net-neutralitys-impact-on-internet-capital-spending-not-clear>.

¹³ John Brodtkin, *30 Small ISPs Urge Ajit Pai to Preserve Title II And Net Neutrality Rules* (June 28, 2017), available at <https://arstechnica.com/tech-policy/2017/06/30-small-isps-urge-ajit-pai-to-preserve-title-ii-and-net-neutrality-rules/> Cf. Dominic Fracassa, *Bay Area Internet Providers Thriving in the Era of Net Neutrality*, San Francisco Chronicle (June 6, 2017)(noting that several San Francisco bay area broadband internet access service providers have invested substantially since the adoption of the Commission’s open internet rules), available at <http://www.sfchronicle.com/business/article/Bay-Area-Internet-providers-thriving-in-the-era-11200806.php>.

economy is much more than just those broadband internet access networks. The internet economy includes all the hardware, software, and network infrastructure of all participants in the internet economy, including all the applications, content, and services available through the internet. It encompasses both the connections between consumers and edge service providers and the applications, content, and services facilitated by those connections. Correspondingly, the goals of promoting greater innovation and investment in the internet economy should be important goals across the *entirety* of the internet economy.

The avowed policy of Congress, and thus of the Commission, is to “promote the continued development of *the Internet*,”¹⁴ not the promotion of broadband internet access service providers or any other specific component of the internet. By focusing solely on investment by broadband internet access service providers, the NPRM fundamentally misperceives the scope of the Commission’s statutory public policy objectives.¹⁵ The Commission should broaden its perspective—to reflect the entirety of the internet economy—in evaluating the merits of its open internet rules.

Edge provider contribution to the U.S. internet economy is massive. The Internet Association found that the overall U.S. internet economy contributed roughly \$900B to the U.S. economy in 2012, more than many other historic market sectors.¹⁶ Perhaps even more salient, however, is the breakdown of the sources of contribution to the internet economy. Of the

¹⁴ Preamble, Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996).

¹⁵ More broadly, the NPRM in many respects conflates “the internet” with broadband internet access services. Rules protecting an open internet are not “regulation of the internet” as stated throughout the NPRM. They are regulation of broadband internet access service, and “the internet” is much, much more than simply broadband internet access service. This tendency to deflate the grandeur of everything that makes up the internet and the internet economy to no more than broadband internet access service is worrisome with respect to the fundamental perspective of the NPRM and thus the Commission.

¹⁶ *IA Internet Value Study* at 39.

\$900 billion overall contribution to U.S. GDP in 2012, only about 15% came from the wired and wireless telecommunications sectors. By far the biggest component of economic contribution came from edge services, with e-commerce contributing nearly half of all value associated with the internet economy.¹⁷ This is consistent with other studies on the value of specific edge services. For example, IDC estimates that by 2020, U.S. revenue for public cloud services and infrastructure will be more than \$120 billion.¹⁸ In a study of online applications that facilitate rich interaction, such as chat, file sharing, and location and payment transactions, WIK found that such applications “generate a significant component of the socioeconomic impact of the digitization of the internet itself.”¹⁹ The NPRM fails to include, or even mention, this tremendous contribution to the internet economy.

This impact goes well beyond revenue. Cloud and other edge service providers invest heavily in innovation and infrastructure. Over the last three years, Microsoft alone has invested \$11-12 billion per year in research and development.²⁰ Microsoft’s global network includes more than a million servers in datacenters around the world, with several in the U.S., including in Virginia, Wyoming, Chicago, Iowa, Texas, and Washington.²¹ Microsoft’s infrastructure investment also includes two new subsea cables landing in the U.S., the NCP cable across the

¹⁷ *Id.*

¹⁸ IDC, *Worldwide Public Cloud Service Spending Forecast to Reach \$122.5 Billion in 2017, According to IDC* (Feb. 20, 2017), available at <http://www.idc.com/getdoc.jsp?containerId=prUS42321417>. Precise definitions of “public cloud” tend to vary depending on usage, but, generally, a public cloud service offers a platform of storage and processing as a service to third parties over public internet or private data transport connections (e.g., MPLS). Amazon EC2 and Microsoft Azure are two leading public cloud services.

¹⁹ Dr. Renee Arnold, et. al., *The Economic and Societal Value of Rich Interaction Applications (RIAs)* (May 2017) (“WIK RIA Study”) at 1, available at <http://www.wik.org/index.php?id=879&L=1>.

²⁰ Microsoft Annual Report 2016 at 18 (2016), available at <https://www.microsoft.com/investor/reports/ar16/index.html>.

²¹ See *Microsoft’s Cloud Infrastructure, Datacenters and Network Fact Sheet* (June 2015), available at <https://www.microsoft.com/en-us/cloud-platform/global-datacenters>

Pacific and the MAREA cable across the Atlantic.²² The combined amount of property, plant and equipment investment by the top three U.S. cloud services providers (Amazon, Google and Microsoft) is more than \$40 billion on a worldwide basis.²³ Investment in cloud infrastructure in the U.S. has been significant enough that it “somewhat offsets a drop in investment by the energy and mining sectors[.]”²⁴ The economic contribution of edge providers to the overall U.S. economy, including innovation and infrastructure, is enormous. Such services must be factored in to any decision by the Commission to eliminate its open internet rules, given the importance of those rules to the health and growth of edge services specifically and thus the internet economy generally.

The impacts of innovation and investment by edge providers also has a positive, self-reinforcing impact on broadband internet access services. In the internet economy, connectivity, content, services, and applications—while no longer tethered to a single network or network operator—all remain critically interdependent. Because of the increased demand for broadband and data connections, traditional network operators benefit significantly from consumer demand for the edge offerings that are delivered over the internet.²⁵ Conversely, edge providers remain critically dependent on more and better broadband internet

²² See Frank Rey, *Microsoft and Facebook to Build Subsea Cable across the Atlantic*, May 26, 2016), available at <https://blogs.technet.microsoft.com/hybridcloud/2016/05/26/microsoft-and-facebook-to-build-subsea-cable-across-atlantic/>

²³ Rachel Stephens, *Infrastructure Investments by Cloud Service Providers* (June 16, 2016), available at <http://redmonk.com/rstephens/2016/06/16/infrastructure-investments-by-cloud-service-providers/>; see also Angel Gonzalez, *Amazon, Microsoft Invest Billions As Computing Shifts To Cloud*, Seattle Times (April 27, 2016), available at <http://www.seattletimes.com/business/technology/amazon-microsoft-invest-billions-as-computing-shifts-to-cloud/>.

²⁴ *Id.*

²⁵ See, e.g., ctia, *Wireless Snapshot 2017* (“ctia Wireless Snapshot 2017”) (increased amount of smartphone data usage due, in part, to “new applications and services”), available at <https://www.ctia.org/docs/default-source/default-document-library/ctia-wireless-snapshot.pdf>.

connections to their customers. The untethering of features from physical networks has only strengthened the interdependent and synergistic relationships between applications and networks. This symbiotic relationship is the *sine qua non* of the Commission’s virtuous cycle model,²⁶ which has been accepted by the D.C. Circuit.²⁷

Beyond the D.C. Circuit’s imprimatur, studies demonstrate the symbiotic relationship between the use of edge services and the resulting investment in broadband networks. A study by WIK demonstrated that demand for edge provider offerings drives significant investment in much of the physical networks, equipment, and infrastructure that comprise the network of networks that is the internet.²⁸ WIK found that broadband networks in Europe benefit significantly from increased bandwidth demand driven by incremental use of applications, and specifically that “higher demand (and potentially willingness to pay) are key in enabling profitable investment and reducing risks for telecommunications providers.”²⁹ A more recent WIK study specifically found that edge applications and services that facilitate rich interaction among users have “substantial positive impact on telecommunications’ providers business.”³⁰

²⁶ See Report and Order, *In the Matter of Preserving the Open Internet*, GN Docket No. 09-191 (Dec. 23, 2010) (“2010 Open Internet Order”) ¶¶ 14, 38.

²⁷ See *Verizon*, 740 F.3d at 644-645. The *Verizon* court went so far as to declare as “uncontroversial” this relationship “between edge-provider innovation and infrastructure development.” *Id.* at 644.

²⁸ See Ilsa Godlovitch, et. al., *Applications and Networks: The Chicken or the Egg, the Role of Digital Applications in Supporting investment and the European Economy* (March 2, 2015) (“WIK 2015 Study”) at I, available at http://www.wik.org/index.php?id=studiedetails&L=1&tx_ttnews%5BbackPid%5D=85&tx_ttnews%5Btt_news%5D=1702&cHash=6a5a758243c9018024f69050a5c75299; see also Analysis Mason, *Investment in Networks, Facilities, and Equipment by Content and Application Providers*, (Sept. 2014), available at <http://www.analysismason.com/CAP-Internet-Sept2014>.

²⁹ See *WIK 2015 Study* at 3.

³⁰ Dr. Renee Arnold, et. al., *The Economic and Societal Value of Rich Interaction Applications (RIAs)*, (May 2017) (“WIK RIA Study”) at ii, available at <http://www.wik.org/index.php?id=879&L=1>. See also Brian Williamson, *High Flown Ideas*, InterMEDIA Vol. 44 Issue 3 (Oct. 2016) at 3 (“Providers of network access do not as a rule pay next generation communications providers for bringing demand to their platforms and vice versa. However, richer applications increase end users’ willingness to pay for network coverage, speed and data capacity. Next-generation communications rather than legacy voice and SMS, help stimulate investment in next-generation

These studies provide analytical support for the virtuous-cycle model of the internet economy set forth by the Commission and upheld by the D.C. Circuit, in which edge provider investment and innovation not only directly benefit the internet economy but also provide substantial indirect benefits in the form of increasing demand for, and thus investment in broadband internet access service networks.

A vibrant, growing internet economy requires more than policies that concentrate solely on the deployment of last mile broadband infrastructure; it also requires a positive environment in which the services, applications, and content accessible over those facilities can thrive. This means adopting a regulatory mindset and promoting policies that support investment and innovation in *all* the components of the internet ecosystem, not just the traditional network players and not just in last mile networks. This is where the NPRM falls short in justifying its proposal to eliminate the Commission’s open internet rules.

The continued growth of the internet economy depends critically on the preservation of an open internet. The Commission has amassed a substantial body of evidence that the permissionless character of the internet economy—preserved through open internet protections—is vital to continued innovation and investment by edge providers.³¹ The D.C. Circuit found that the connection between an open internet and innovation at the edge was not only reasonable but “grounded in substantial evidence.”³² None of that evidence has diminished in any way. An open internet remains necessary for the internet and the U.S.

networks.”), available at <https://www.iicom.org/intermedia/intermedia-past-issues/intermedia-october-2016/high-flown-ideas>.

³¹ See, e.g., *2010 Open Internet Order* ¶¶ 13-14; Report and Order on Remand, Declaratory Ruling and Order, *Protecting and Promoting an Open Internet*, GN Docket No. 14-28 (March 12, 2015) (“2015 Open Internet Order”) ¶ 76.

³² *Verizon*, 740 F.3d at 644-45.

internet economy to continue to flourish. Without an open internet, broadband internet access service providers gain the power to outright prevent edge content and services from reaching their customers, levy tolls on edge providers and customers for access to edge content and services, and pick winners and losers in the internet economy, thus subjecting edge provider success to the control of broadband internet access services providers rather than the forces of customer demand. These outcomes create risk for edge providers that threatens to redirect capital in a manner that may prevent edge providers from ever entering the market in the first place or innovating beyond current trajectories, which has the potential to undermine our internet economy. Consumers, and the economy as whole, benefit when edge providers distinguish themselves through *innovation*, rather than on their *ability to pay* broadband access providers fees for preferential treatment.

In evaluating the need for open internet protections, the Commission should give weight to the impact of such rules on investment and innovation by edge providers as well as broadband internet access services providers—and every other participant in and constituent of the internet economy. The Commission cannot simply ignore all aspects of the internet economy other than investment by broadband internet access service providers. When viewed from the proper perspective, there should be no doubt that the proper balancing of public policy objectives compels retention of rules that protect the open internet. An open internet is the oxygen which fuels demand for and investment in edge services, which is not only the predominant component of the internet economy as a whole but also drives greater investment by broadband internet access services providers through increased demand for more and better broadband internet access services.

II. MICROSOFT'S OWN EXPERIENCES BEAR OUT THAT THE BRIGHT LINE RULES, THE TRANSPARENCY RULES AND THE GENERAL CONDUCT STANDARD ARE ALL STILL REQUIRED TO PROTECT AGAINST THE INCENTIVES OF FIXED AND MOBILE BROADBAND INTERNET ACCESS SERVICE PROVIDERS TO INTERFERE WITH TRAFFIC ON THEIR NETWORKS

The NPRM questions whether there remains a need for *ex ante* open internet regulations.³³ The answer is a resounding yes. The success of broadband internet access service as an enabler of economic, social, and cultural development depends on whether users have unhindered access to the online content, applications, and services of their choice. Interference by the broadband internet access services providers with traffic on their networks is incompatible with the fundamental principles of an open internet; it distorts the marketplace and improperly influences subscribers' decisions to access edge services.

Outright blocking of traffic, as well as throttling, degrading, and impairing of traffic, present obvious harms to the ability of all of us to access and use the lawful internet content, services, and applications of our choice. Preferential transmission arrangements such as paid prioritization also are particularly concerning, because broadband internet access service providers can use their control over their networks to pressure edge providers into entering such arrangements and to demand increasingly higher tolls and greater concessions from edge providers over time.³⁴ Preferential transmission arrangements also could chill deployment of faster, more reliable broadband internet access services, as providers concentrate instead on reaping the rewards of these potentially lucrative deals.³⁵

³³ NPRM ¶¶ 70, 77.

³⁴ See *Microsoft 2014 Comments* at 9-10.

³⁵ See *Microsoft 2014 Comments* at 12.

The NPRM asks specifically whether paid prioritization could give broadband internet access services providers a “supplemental revenue stream that would enable them to offer lower-priced broadband Internet access service to end-users.”³⁶ Paid prioritization clearly *would* afford broadband internet access service providers the potential of a “supplemental revenue stream,” but that’s just a different way of saying that paid prioritization allows broadband internet access services providers to charge a toll to edge providers, even though consumers already pay directly for broadband internet access services.

Commission authorization of paid prioritization would interfere with consumer demand, harm edge provider investment and innovation, and reduce incentives for broadband internet access services providers to invest in more and better network capacity to meet consumer demand. Some smaller broadband internet access service providers worry that it could allow bigger providers to force smaller providers out of the market.³⁷ It also would be fundamentally contrary to Commission policy that consumer prices for network services should be based on the provision of service to the consumer by the network operator, not on the ability of the network operator to shift costs to other sources.³⁸ Having spent decades eliminating the market distorting effects of terminating access charges, now is not the time for the Commission to re-introduce those distortions by allowing terminating tolls for prioritization of internet traffic.

³⁶ NPRM ¶ 29.

³⁷ See Jacob Kastrenakes, *The FCC Says Net Neutrality Destroys Small ISPs. So Has It?*, THE VERGE (July 13, 2017), available at <https://www.theverge.com/2017/7/13/15949920/net-neutrality-killing-small-isps>.

³⁸ See *Microsoft 2014 Comments* at n.22.

Affording everyone the same opportunity to participate in the digital economy means that broadband internet access services providers must not be allowed to block, degrade, or throttle internet traffic on their networks. It also means that broadband internet access services providers may not prioritize, prefer or provide “fast lanes” to some internet traffic on their networks. That’s what the Commission’s open internet rules ensure, and it’s why the rules need to be retained.

In asking whether rules are still necessary, the NPRM asks whether there have been “concrete incidents” of broadband internet access services provider behavior warranting rules and whether broadband internet access services providers have incentives to continue to engage in such behavior.³⁹ In asking that question, the NPRM seems to embody a short and narrow recollection of broadband internet access services provider behavior and incentives. Microsoft noted in its comments to the Commission only three years ago that it has witnessed first-hand, on a global basis, the results of the universal incentives of broadband internet access service providers to give preferential treatment to some traffic on their networks and their abilities to act on those incentives to the detriment of edge providers and their customers.⁴⁰ It is precisely to mitigate against those incentives that the Commission must preserve an open internet.

For over a decade now, since Madison River Communications outright blocked Vonage on Madison River’s network⁴¹ and Ed Whitacre declared that he would not allow companies like

³⁹ NPRM ¶ 77.

⁴⁰ See *Microsoft 2014 Comments* at 1-2

⁴¹ See, e.g., Declan McCullagh, *Telco Agrees To Stop Blocking VoIP Calls*, (March 3, 2005), available at <https://www.cnet.com/news/telco-agrees-to-stop-blocking-voip-calls/>; Ben Charney, *Vonage Says Broadband Provider Blocks Its Calls*, (Feb. 04, 20015), available at <https://www.cnet.com/news/vonage-says-broadband-provider-blocks-its-calls/>.

Google to use “his pipes for free,”⁴² it has been abundantly clear that broadband internet access service providers have a strong economic incentive to monetize their control over the use of their networks to gain access to internet content, applications, and services. They may act on those incentives by charging edge providers a toll to reach their customers, as Mr. Whitacre suggested, by charging edge providers for preferential treatment on their networks, by giving their own traffic preference on their networks over third party traffic, and myriad other means.

The economic incentives of broadband internet access service providers are sufficiently apparent that the D.C. Circuit confirmed them without hesitation. Thus, even in striking down the Commission’s rules in the *Verizon* decision, the court agreed that “[b]roadband providers also have powerful incentives to accept fees from edge providers, either in return for excluding their competitors or for granting them prioritized access to end users.”⁴³ That pronouncement was based in part on the candid admission by counsel for Verizon at oral argument that “but for [the Commission’s open internet rules, Verizon] would be exploring these commercial arrangements” with edge providers.⁴⁴ Overall, the court found nothing in the record to give it “any reason to doubt the Commission’s determination that broadband providers may be

⁴² His complete statement was: “Now what [companies like Google, Yahoo! And Vonage] would like to do is use my pipes for free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes? The Internet can't be free in that sense, because we and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!” See Mike Masnick, *SBC: We Own the Internet, So Google Should Pay Up* (Oct. 31, 2005), available at <https://www.techdirt.com/articles/20051031/0354228.shtml>. Allowing broadband internet access services providers to earn “supplemental income” by charging to prioritize traffic, see *supra* p. 11, is essentially a nod to Mr. Whitacre’s desire to charge certain edge providers for the use of his pipes.

⁴³ *Verizon*, 740 F.3d at 645.

⁴⁴ *Id.*

motivated to discriminate against and among edge providers.”⁴⁵ Moreover, the D.C. Circuit directly addressed the implication in the NPRM that concern over those economic incentives is no more than speculation, stating that the descriptions of the economic incentives of broadband internet access service providers are “at the very least, speculation based firmly in common sense and *economic reality*.”⁴⁶

Microsoft’s experience bears out those “economic realities.” Time and time again Skype has borne the brunt of broadband internet access services providers all over the world acting on their economic incentives by interfering with Skype traffic on their networks. In the absence of open internet protections, Skype has seen broadband internet access service providers:

- block Skype traffic on their networks;
- degrade Skype traffic on their networks;
- interfere with the operation of Skype on their networks;
- drop Skype packets on their networks;
- terminate Skype sessions on their networks;
- charge their customers a toll to be able to use Skype on their networks; and
- interfere with the ability of customers to log in to their Skype accounts.⁴⁷

Many of these examples occurred several years ago, but the “economic realities” underlying these broadband internet access service provider actions remain, which, in countries without open internet protections, allows broadband internet access services providers to continue to find new ways to interfere with traffic on their networks. Indeed, only three years ago, Digicel,

⁴⁵ *Id.*

⁴⁶ *Id.* (Emphasis added.)

⁴⁷ See *Microsoft 2014 Comments* at 1-2.

the predominant mobile broadband internet access service provider in the Caribbean, suddenly blocked access to Skype and other VoIP providers on Digicel's networks.⁴⁸ Access was restored only when regulators intervened and questioned the legality of Digicel's action. This is the sort of "economic reality" that prevails in countries without open internet protections.

It is precisely because of the diverse array of interference available to broadband internet access service providers that all the Commission's open internet rules need to be preserved. The transparency rules help illuminate practices which might otherwise be difficult to detect. They also encourage broadband internet access service providers to abide by the bright line and general conduct rules.⁴⁹ Perhaps most important, the transparency rules allow customers to fully inform themselves to make the sort of decision-making promised by a competitive marketplace.⁵⁰ The bright line rules prohibiting broadband internet access service providers from blocking, throttling, degrading, or impairing traffic on their networks, and prohibiting them from engaging in paid prioritization, are necessary to address specific actions that broadband internet access services providers have either engaged in or threatened to engage in. The history of broadband internet access services provider interference with traffic on their networks, however, demonstrates the inability to predict all the myriad methods broadband internet access services providers might use to interfere with traffic on their

⁴⁸ See, e.g., TeleGeography, *Digicel and LIME Block VoIP Providers* (July 3, 2014), available at <https://www.telegeography.com/products/commsupdate/articles/2014/07/03/digicel-and-lime-block-voip-providers/>; TeleGeography, *Digicel Haiti Blocks VoIP Applications* (June 25, 2015), available at <https://www.telegeography.com/products/commsupdate/articles/2014/06/25/digicel-haiti-blocks-voip-applications/>; Elizabeth Trovall, *Trinidad and Tobago Regulator Investigates Digicel's VoIP Block* (July 9, 2014), available at <https://www.bnamericas.com/en/noticias/regulador-trinitense-investiga-bloqueo-voip-de-digicel>.

⁴⁹ See *2010 Open Internet Order* ¶ 53.

⁵⁰ See *2015 Open Internet Order* ¶ 24.

networks. And that is precisely why the general conduct rule prohibiting unreasonable interference and unreasonable disadvantage also is necessary.

Broadband internet access service provider interference with traffic has no relationship to reasonable network management practices.⁵¹ No one disputes that broadband internet access service providers have legitimate needs to manage network traffic in order to, for example, “ensur[e] network security and integrity, including by addressing traffic that is harmful to the network; addressing traffic that is unwanted by end users (including by premise operators), such as by providing services or capabilities consistent with an end user’s choices regarding parental controls or security capabilities; and reducing or mitigating the effects of congestion on the network.”⁵² Microsoft does not endorse any policy that would completely prohibit the ability of broadband internet access service providers to fairly use network management tools to overcome genuine technical challenges and maintain high-quality service. Indeed, particularly when several users attempt to access the internet at the same time, certain traffic management techniques may be the only way to ensure the provision of broadband internet access service to as many users as possible.

These reasonable network management practices are based on standard industry protocols and on *technical* or *operational* decisions intended to maintain a robust, safe, and secure internet experience for all users. Unlike these reasonable network management practices, interference with network traffic of the sort prohibited by the Commission’s open internet rules is based on purely *economic, commercial* considerations, including preferential

⁵¹ *Microsoft 2014 Comments* at 11-12.

⁵² *2010 Open Internet Order* ¶ 82.

treatment of a broadband internet access service provider's own traffic, the preference or disadvantage of third party traffic, and the assessment of a toll on third party traffic. That is precisely why the Commission should not eliminate the "technical management" restriction on allowable network management practices as suggested in the NPRM.⁵³ Technical considerations should be the limit of appropriate network management.

Other countries that have followed the Commission in enacting open internet protections reflect the distinction between ability of broadband internet access services providers to ensure that their networks run as efficiently as possible, and their ability to interfere with traffic on their networks to handpick the winners and losers in the market for internet content, services, and applications. In its *Guidelines on the Implementation by National Regulators on European Net Neutrality Rules*, the Body of European Regulators for Electronic Communications (BEREC) makes clear that traffic management practices may be considered reasonable only if "they are transparent and are aimed at properly configuring and securing the network and its equipment by efficiently balancing load, e.g. by reacting as fast as possible in case of congestion, failures, outages, etc."⁵⁴ BEREC has made clear that traffic management practices may not be based on commercial considerations, may not be used to monitor specific content, and may not be maintained longer than necessary."⁵⁵ The Canadian CRTC was even more direct in its review of internet traffic management practices, stating that

⁵³ NPRM ¶ 93.

⁵⁴ BEREC, *BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules* (August 2016) at 18, available at http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/6160-berec-guidelines-on-the-implementation-by-national-regulators-of-european-net-neutrality-rules.

⁵⁵ *Id.*

“investment in network capacity,” rather than traffic throttling or blocking, should be the primary solution broadband internet access service providers employ to combat network congestion.⁵⁶ The Commission’s open internet rules strike the right balance between preserving the ability of broadband internet access services providers to manage their networks and prohibiting them from interfering with traffic on their networks for reasons other than legitimate traffic management concerns.

Finally, it remains critical that the Commission’s open internet rules apply with equal force to fixed and mobile broadband internet access services. If the Commission truly wants to preserve an open internet—now and into the future—there is no question that mobile and fixed broadband access services should be subject to the same legal framework. Any technical or operational differences between mobile and fixed networks can be accommodated by continuing to recognize that the meaning of “reasonable network management” might vary depending on the particular type of network, as reflected in the open internet rules. As the Commission found, these differences do not require mobile broadband internet access services to be subject to weaker open internet protections.⁵⁷

Microsoft demonstrated to the Commission three years ago that we live in a mobile-first world, with mobile broadband internet access becoming more and more important as a means of accessing edge services.⁵⁸ Nothing in the last three years has diminished the force of that

⁵⁶ CRTC, *Review of the Internet traffic management practices of Internet service providers* (Oct. 21, 2009), available at <http://www.crtc.gc.ca/eng/archive/2009/2009-657.htm>.

⁵⁷ See, e.g., *2015 Open Internet Order* ¶ 101.

⁵⁸ See *Microsoft 2014 Comments* at 20-23.

conclusion. To the contrary, the Commission’s finding in 2015 that consumers “increasingly rely on mobile broadband as a platform to the Internet” is even stronger today.⁵⁹

We live in an indisputably mobile device-centric world. According to CTIA, “[m]obile device use continues to rise increase across all demographics.”⁶⁰ Ninety-five percent of U.S. adults own a cellphone (compared to seventy eight percent who own a computer), and there are more wireless devices than Americans; all of which make “the wireless platform nearly ubiquitous.”⁶¹ Smartphones, in particular, now represent nearly eighty percent of the U.S. population and drive increased data usage, on faster networks, more sophisticated phones, and new applications and services.⁶²

More and more, mobile devices are the “sole means” of many consumers for accessing the internet.⁶³ In March 2015, for the first time, comScore reported that “the number of mobile-only adult internet users exceeded the number of desktop-only internet users.”⁶⁴ Correspondingly, by December 2015, Marketingland reported that “mobile audiences for the top 100 digital properties, in the aggregate, [surpassed] the desktop audience.”⁶⁵ The numbers show a similar trend for time spent on the internet. The number of minutes per day accessing

⁵⁹ 2015 Open Internet Order.

⁶⁰ ctia Wireless Snapshot 2017.

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

⁶⁴ Adam Lella, *Number of Mobile-Only Internet Users Now Exceeds Desktop-Only in the U.S.* (April 28, 2015) (“comScore”), available at <https://www.comscore.com/Insights/Blog/Number-of-Mobile-Only-Internet-Users-Now-Exceeds-Desktop-Only-in-the-U.S.>

⁶⁵ Greg Sterling, *All Digital Growth Now Coming from Mobile Usage—comScore* (April 3, 2016)(“Marketingland”), available at <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwioKLhuuTUAhUC5oMKHQA5CCkQFggiMAA&url=http%3A%2F%2Fmarketingland.com%2Fdigital-growth-now-coming-mobile-usage-comscore-171505&usg=AFQjCNHeXqlyLvhlCsy-zj2zDra2UdBvfw.>

the internet from mobile devices consistently increased each year from 2016 to 2018, while the number of minutes accessing the internet from a desktop consistently decreased each year.⁶⁶ Overall, mobile devices accounted for 74% of total internet use in the U.S. in 2016 and is projected to account for 83% in 2018.⁶⁷ Mobile devices are now the “growth driver” of U.S. internet activity⁶⁸ and have become the “primary access point to the internet” in the U.S.,⁶⁹ to the point the desktop “is rapidly becoming a ‘secondary touchpoint’ for a large percentage of the U.S. digital audience.”⁷⁰

The use of mobile *networks* to gain access to edge services also continues to grow. “Wireless subscribers sent an additional four trillion megabytes over [U.S. mobile] networks over 2015 levels—and since 2010, data traffic has increased by a factor of 35.”⁷¹ The last two years alone, “data use has increased 238 percent” on mobile networks.⁷² Fixed, home broadband use appears to have plateaued in 2015,⁷³ reflecting continued growth in mobile access to broadband internet access services, with as many as twenty percent of households now mobile-only, “compared with 1 in 10 in 2013. That’s a doubling in just two years.”⁷⁴

⁶⁶ Jemma Brackebush, *How Mobile is Overtaking Desktop for Global Media Consumption, in 5 Charts* (June 14, 2016), available at <https://digiday.com/media/mobile-overtaking-desktops-around-world-5-charts/>.

⁶⁷ Zenith, *Zenith Forecasts 75% of Internet Use Will Be Mobile in 2017*, available at <https://www.zenithmedia.com/mobile-forecasts-75-internet-use-will-mobile-2017>.

⁶⁸ *Marketingland*.

⁶⁹ *comScore*.

⁷⁰ *Marketingland*.

⁷¹ *ctia Wireless Snapshot 2017*.

⁷² *Id.*

⁷³ John B. Horrigan, Pew Research Center, *Home Broadband 2015* (Dec. 21, 2015), available at <http://www.pewinternet.org/2015/12/21/home-broadband-2015/>.

⁷⁴ Brian Fung, *New Data: Americans are Abandoning Wired Home Internet*, Washington Post (April 28, 2016), available at https://www.washingtonpost.com/news/the-switch/wp/2016/04/18/new-data-americans-are-abandoning-wired-home-internet/?utm_term=.72b6df178713.

Statistics such as these clearly depict an ever-increasing use of mobile networks to access edge services.

There really is no dispute that mobile broadband is an increasingly critical means for edge providers to reach consumers online. If the Commission wants to preserve an open internet on a comprehensive basis, mobile and fixed broadband internet access services must remain subject to the same legal framework, while accommodating technical differences between these networks through a flexible reasonable network management standard.

III. THE COMMISSION SHOULD CONTINUE TO MONITOR ARRANGEMENTS REGARDING INTERCONNECTION AND THE EXCHANGE OF TRAFFIC WITH BROADBAND INTERNET ACCESS SERVICE PROVIDERS

In its *2015 Open Internet Order*, the Commission determined that it would continue to monitor internet traffic exchange and interconnection rather than adopt bright line rules governing such practices.⁷⁵ The Commission should continue to do so, and it should be prepared to act swiftly if it appears that broadband internet access service provider practices thwart the effectiveness of its open internet rules.

As the Commission has found, there are a wide variety of practices and business models representing the ways in which networks are interconnected and traffic is exchanged to allow end users to access end points on the internet.⁷⁶ Ultimately, though, broadband internet access service providers control the manner in which traffic bound for their customers flows from other networks to their own. Some of these arrangements could allow a broadband internet access service provider to interfere with or prefer traffic from some interconnecting

⁷⁵ *2015 Open Internet Order* ¶ 202.

⁷⁶ *Id.* at ¶¶ 196-198.

networks over others, even while treating all traffic the same within its own network as required by open internet rules. In the past, disputes over such arrangements have been resolved on a commercial basis, and Microsoft hopes that will continue to be the case. However, recent trends, such as increased reluctance to enter into settlement-free peering arrangements, give pause that broadband internet access service providers may be giving consideration to using their control over or role in interconnection to circumvent open internet rules. The Commission should remain alert for any practices that threaten to create such market distortions and be prepared to respond swiftly if interconnection arrangements are used to subvert or evade open internet protections.

CONCLUSION

The vast potential of today's U.S. internet economy depends on the ability of everyone to access the internet without interference from broadband internet access service providers. Such open access not only fulfills consumer demand; it promotes fair competition in the digital marketplace, economic growth, and social and cultural development. An open internet that embodies these principles preserves a competitive landscape in which consumers—not broadband internet access service providers—decide which edge services succeed in and propel the internet economy. This framework is critical not only to the successful investment and innovation in edge services themselves but also high-speed internet broadband access services and infrastructure across the U.S. It is a bedrock foundation of the country's economic growth, leadership in innovation, and longstanding commitment to free expression, robust competition, and democratic ideals. Now is not the time for the Commission to abandon fifteen years of

progress toward protecting the economic future of our country. Now is not the time for the Commission to abandon its open internet rules.

Respectfully submitted,

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