

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20544**

In the Matter of)	
)	
Framework for Broadband Internet Service)	GN Docket No. 10-127
)	
Open Internet Rulemaking)	GN Docket No. 14-28
)	

COMMENTS OF VERIZON AND VERIZON WIRELESS

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TABLE OF CONTENTS

	<u>Page</u>
I. TODAY’S OPEN INTERNET BENEFITS CONSUMERS, EDGE PROVIDERS, AND BROADBAND PROVIDERS, AND A BALANCED APPROACH THAT PROTECTS CONSUMERS AND COMPETITION WHILE ENCOURAGING INNOVATION AND INVESTMENT WILL KEEP IT THAT WAY.	4
A. Verizon Strongly Supports an Open Internet and Has Strong Incentives to Promote Internet Openness.	5
B. Internet Openness Is Best Promoted Through A Flexible Framework Rather than Prescriptive Rules.....	10
II. FLEXIBILITY, INNOVATION, AND CONSUMER CHOICE SHOULD GUIDE THE COMMISSION’S APPROACH, WHETHER OR NOT IT DECIDES TO ADOPT FURTHER RULES.....	16
A. Any Additional Transparency Requirements Must Be Reasonable and Limited to the Disclosing ISP’s Own Network.....	21
B. Any New No-Blocking Rule Should Ensure No Blocking of Content on the Customer’s Selected Tier of Service But Should Allow Flexibility for Additional Differentiated Services.	25
C. Any Commercial Reasonableness Standard Should Allow Flexibility for Pro-Consumer Innovation and Experimentation.....	29
D. Under the Proposed Commercial Reasonableness Rule, the Commission Could Address Particular Practices That Harm Consumers or Competition.	36
III. ADDITIONAL REGULATION IS ESPECIALLY UNWARRANTED IN THE MOBILE BROADBAND MARKETPLACE, WHICH PRESENTS UNIQUE CIRCUMSTANCES AND IN WHICH AMERICA LEADS THE WORLD.	38
A. Unique Features Distinguish Mobile Broadband Service from Fixed Broadband Service.....	39
B. Mobile Wireless Broadband’s Unique Features Warrant a Particularly Light-Touch Regulatory Approach.....	43
IV. BROADBAND RECLASSIFICATION WOULD BE A RADICAL AND RISKY STEP THAT WOULD JEOPARDIZE NATIONAL GOALS AND VIOLATE THE COMMUNICATIONS ACT.....	46
V. THE COMMISSION SHOULD REFRAIN FROM IMPOSING ANY RULES ON INTERNET INTERCONNECTION ARRANGEMENTS, SPECIALIZED SERVICES, OR ENTERPRISE OFFERINGS.....	69
A. There Is No Reason to Apply Open Internet Rules to Peering, Transit, and Other Internet Interconnection Arrangements.....	70
B. There Is No Reason to Apply Open Internet Rules to Specialized Services..	76
C. There Is No Reason to Apply Open Internet Rules to Enterprise Services...	77
VI. CONCLUSION	78

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Maintaining an open, healthy and robust Internet is a paramount goal that benefits consumers, edge providers, broadband providers, and countless others. Nothing about the litigation that led to the remand of the Commission’s 2010 *Open Internet Order*, or the result of that dispute, should distract observers from the core point that Verizon supports and relies upon a robust and open Internet. Our customers demand it, and our business depends on it. We have committed to our customers our support for the open Internet, and our broadband Internet access services enable them to go where they want and do what they want online. We invest in world-class broadband networks, such as our all-fiber FiOS network and our 4G LTE wireless network, to keep pace with consumers’ demand and offer an ever-more-robust range of services. We also are actively engaged in many other parts of the Internet ecosystem, including through our Internet backbone networks, content delivery networks, over-the-top services, cloud-services, and other innovative services that rely on the open Internet and enable a better Internet experience. Each of these efforts depends on an open Internet and on the ability to reach

¹ In addition to Verizon Wireless, the Verizon companies participating in this filing are the regulated, wholly owned subsidiaries of Verizon Communications Inc. (collectively, “Verizon”)

consumers over the networks, software platforms and services of other providers. Verizon's various offerings create more choices for our end-user consumers and for those served by other broadband providers. In each of these areas, we face competition from a large and growing number of other providers, both traditional and non-traditional, while also increasingly partnering with a wide range of players to develop and offer new services and offerings to consumers. Broadband providers are responding to competition as one would expect and hope: By deploying more and better facilities, expanding the speeds and capacities of their service offerings, and offering consumers competitive prices. The light-touch approach pursued over the last two decades by policymakers of both parties has been central to these successes, and it continues to provide the foundation for innovation and investment that serves consumers well.

For the reasons explained below, further regulation of broadband providers' behavior is not needed at this time and would threaten the healthy dynamics fueling the growth and continued improvement of the Internet and the many services it enables. Competition and innovation are widespread throughout the Internet ecosystem, and ensure that the marketplace is responsive to consumer demand. Indeed, end users have accessed the Internet literally billions of times since the early 1990s, when Internet access service first became widely available, and yet proponents of regulation can only point to a few isolated and dated incidents of alleged problems. Existing legal protections, including the Commission's transparency rule and generally applicable antitrust and consumer protection laws, as well as multi-stakeholder groups, already provide an effective backstop to prevent and address any future issues that could emerge. Should the Commission decide nevertheless to adopt rules it must strive to pursue a balanced approach that protects consumers and the open Internet while preserving the principles of flexibility, innovation, and consumer choice that have marked its approach until now. A

continued focus on transparency, supported by the Commission's existing rule, is central to such an approach and should ensure that consumers have the information they need to understand their service options and to make informed choices. The benefits of transparency to competition on the Internet extend well beyond broadband providers' services, as it is irrefutable that a wide range of Internet companies beyond broadband providers principally shape the consumer experience.

The Commission has also proposed to reinstate a no-blocking rule. Verizon has been clear with our customers that we will not block their access to any content, applications, services or devices based on their source. Any new no-blocking rule should be consistent with that approach and ensure providers do not block any lawful Internet traffic within the customer's chosen Internet access service. But, consistent with the D.C. Circuit's decision, the Commission should allow flexibility for providers to negotiate differentiated arrangements or experiment with different service models if they see a customer benefit in doing so, even as customers can continue to go anywhere using their selected tier for Internet access service and edge providers can rely on that service to reach their customers without the need for negotiating with broadband providers for access to end-users.

Similarly, a commercial reasonableness standard, if appropriately applied, could allow the flexibility for innovation that will benefit consumers while also providing a backstop that would permit the Commission to address problems or market failures that arise and that harm competition or consumers. Any commercial reasonableness standard should allow real flexibility for new approaches that may better serve consumers, even as they continue to receive traditional Internet services.

If the Commission proceeds with new regulations, it should limit such rules to fixed broadband Internet access services, and should continue to recognize the unique circumstances of the mobile marketplace – including the technical, competitive, and operational differences – warranting a more restrained approach. This rapidly evolving sector requires particular flexibility to serve consumers well, and high levels of innovation, investment and competition resulting from the light-touch approach speak for themselves.

Finally, “reclassification” of broadband Internet access service as a Title II common carriage telecommunications service would be a radical departure that would not achieve its proponents’ stated goals and would only endanger the entire Internet ecosystem. The arcane regulatory framework embodied in Title II was crafted for 19th Century railroad monopolies and the early 20th Century one-wire telephone world. The price and service regulation inherent in Title II have no place in today’s fast-paced and competitive Internet marketplace, and the threats posed by this approach would not likely be confined to broadband providers but would spread inevitably to other Internet sectors. Moreover, such an approach would be unlawful and, at a minimum, would result in years of counterproductive uncertainty for the entire industry. In contrast, a balanced framework will ensure that broadband providers act reasonably and would protect against backsliding or bad acts that threaten consumers or competition, while preserving flexibility for all providers to experiment with new approaches that could offer new choices and benefit consumers and small Internet players alike.

I. TODAY’S OPEN INTERNET BENEFITS CONSUMERS, EDGE PROVIDERS, AND BROADBAND PROVIDERS, AND A BALANCED APPROACH THAT PROTECTS CONSUMERS AND COMPETITION WHILE ENCOURAGING INNOVATION AND INVESTMENT WILL KEEP IT THAT WAY.

A casual observer of the open Internet debate over recent months could be forgiven for believing we are on the edge of a cataclysm, in which those seeking to preserve the Internet,

expand its reach, and extend its many capabilities square off against profit-hungry Internet Service Providers (ISPs) aiming to extract ever-higher monopoly rents, undermine third-party content providers, and squelch political debate. This view has been promoted by superficial news reports, sensationalistic interest-group fund-raising appeals, and even late-night comedy routines. But, as is so often the case, the truth is far less dramatic. Once the political cant and commercial posturing are discarded, the core fact in this debate remains – namely, that ISPs such as Verizon strongly favor, and benefit from, network openness. Verizon has invested billions of dollars in businesses that rely on the open Internet, which our customers view as essential and which is therefore a critical ingredient to our success as an ISP. Verizon has entered into adjacent lines of business, offering content and related offerings that must transit the last-mile networks, software platforms, search engines and services of other providers throughout the ecosystem. From our perspective, the objective of this proceeding is not to subvert or evade principles of Internet openness, but rather to ensure that the Internet remains open while also promoting the innovation and customer-driven evolution that has made it the greatest communications platform in modern history.

A. Verizon Strongly Supports an Open Internet and Has Strong Incentives to Promote Internet Openness.

The suggestion that broadband providers have incentives to undercut Internet openness fundamentally misunderstands the increasingly competitive and complex structure of the online ecosystem. Consumers enjoy a dizzying array of services offered by a host of rival providers. In today's competitive and dynamic Internet marketplace, stakeholders often partner with one another to provide certain services while competing in the provision of others – and the last-mile

access link is only one input among many.² Entities that offer network capacity, online services, applications, content, and devices simultaneously partner with and compete against one another to offer broadband and related services.³ For example, Verizon Wireless partners with Google to develop and advance the Android platform, while Verizon and Google compete in providing cloud computing services. This kind of “mix-and-match” competition is fast collapsing traditional distinctions between and among participants in the broadband arena.⁴

In this environment, companies such as Verizon have no incentive to abridge customers’ Internet freedoms or assign anyone to a slow lane. Verizon has invested tens of billions of dollars to build our wired and wireless broadband networks, including more than \$23 billion spent to construct our fiber-optic FiOS network since 2004, and we continue to expend large sums to improve and grow those networks.⁵ We must recoup these investments. The only way to do so is *to win and retain customers*, and the only way to do *that* is to offer them the services and features they demand – including access to the content and applications they want to use. The suggestion that ISPs can benefit in the long term by limiting use of their networks and funneling users to ISP-affiliated content is a politically motivated fantasy.

² See, e.g., Jeffrey A. Eisenach, *Broadband Competition in the Internet Ecosystem*, AEI ECONOMICS STUDIES, at 18 (Oct. 18, 2012), http://www.aei.org/files/2012/10/17/-broadband-competition-in-the-internetecosystem_164734199280.pdf (“Although it is certainly understandable that the modern telecommunications intelligentsia would see broadband as the center of the Internet ecosystem ... it is not. For purposes of competition analysis, at least, broadband is a complement among complements, a module among modules.”) (“BROADBAND COMPETITION”).

³ See generally Declaration of Andres V. Lerner, *Competition in Broadband and “Internet Openness”*, ¶¶ 67-68 (July 15, 2014), attached hereto as Exhibit 2 (“Lerner Decl.”) (discussing platform competition).

⁴ See, e.g., BROADBAND COMPETITION at 18.

⁵ Verizon is targeting total capital investments of between \$16.5 billion and \$17 billion in 2014 alone. See *Verizon 2014 Investor Quarterly, First Quarter* (Apr. 24, 2014), available at http://www.verizon.com/investor/DocServlet?doc=vz_1q2014_bulletin.pdf. See also Lerner Decl., ¶ 41 (“When Verizon launched FiOS in 2004, the company announced plans to spend about \$23 billion over several years to build out the necessary fiber infrastructure.”), ¶ 72 (“[A]nnual investment in U.S. wireless networks grew from \$21 billion in 2009 to \$30 billion in 2012. In 2011, wireless broadband providers Verizon and AT&T were the top two American firms in terms of capital expenditures.”).

Even if one assumed (wrongly) that there is some short-term gain to be had in this manner, it would be vastly outweighed by the losses that would ensue when customers began to discontinue service in favor of the ISP's competitors. Verizon expends a significant amount to build its network and attract and connect each FiOS customer we acquire, all with the hope that a long-lasting relationship will allow us to recoup these investments and profit from each customer over time. But, as illustrated by the churn that takes place in the industry, customers can and do switch providers when their own provider makes them unhappy.⁶ In fact, "there is significant customer switching in the broadband industry, particularly in recent years....A 2010 Commission study found that 36 percent of Internet users had switched broadband service providers in the prior three years."⁷ A short-term stratagem to obtain marginal increases in revenues through "tolls" on edge providers or favoritism would backfire when the customer inevitably switched to another ISP, resulting in the loss of thousands of dollars in potential lifetime revenues from a satisfied customer. For example, if Verizon engaged in unpopular practices that resulted in the loss of even just 2 percent of FiOS customers, that would equate to more than \$200 million in lost revenue per year. Thus, in our capacity as a broadband provider, Verizon has strong reasons to promote Internet openness.

Our incentive to embrace openness is not, however, limited to the fact that our broadband customers demand it. Verizon's wireline footprint is limited, and we thus increasingly rely on the Internet services of *other broadband providers* to serve our customers and to support the strategic services in which we are investing for the future. To provide just a few examples, Verizon (in partnership with Redbox) offers an over-the-top video service that is available over

⁶ See, e.g., Lerner Decl. ¶¶ 73-76.

⁷ Id. ¶ 46, citing Federal Communications Commission, *Broadband Decisions: What Drives Consumers to Switch – or Stick With – Their Broadband Internet Provider*, at 3 (Dec. 2010), https://apps.fcc.gov/edocs_public/attachmatch/DOC-303264A1.pdf.

any broadband connection in the country. We have focused heavily on the growing area of cloud-based services through our Verizon Enterprise Solutions business. Our Verizon Digital Media Services business provides a variety of services to facilitate online video and other data processing and distribution across the Internet. With the recent purchase of EdgeCast, we now operate a significant global content delivery network.⁸ In all these capacities, Verizon depends upon the existence of an open Internet, and on the ability to reach consumers over the networks, software platforms, search engines and services of other providers. Indeed, the vast majority of Internet customers, both nationwide and globally, subscribe to broadband providers other than Verizon, meaning that we must regularly send traffic over the networks of third-party ISPs, and rely on other providers to direct and connect them to the content and services they desire. Verizon would be deeply concerned if any player in the Internet ecosystem – another ISP, a large content provider, a search engine, a major social network, an operating system provider, or any other entity – were to keep end users from utilizing the Internet on their own terms or to restrict the availability of Verizon’s services to those end users.

Put bluntly, Verizon’s own business model depends on market-driven Internet openness. To this end, Verizon has publicly committed to customers that we will maintain an open network for them. For example, our website promises users that they “can access and use the legal content, applications, and services of your choice, regardless of their source” on “any of our Internet access services, wireline or wireless,” “so long as they are legal and do not harm our networks or the provision of Internet access service, facilitate theft of service, or harm other users of the service.” Users likewise “can attach to the Verizon Wireless network any device marketed by Verizon Wireless, or certified through the Verizon Wireless Open Development

⁸ See generally Verizon, *What We Do*, <http://about.verizon.com/our-company/products-services>.

program.” Verizon promises to provide customers “accurate and relevant information in plain language about the characteristics and capabilities of our Internet access services so you can make informed choices,” as well as “tools to keep track of ... usage to avoid surprises....”⁹

Far from blocking user access to content and applications or advantaging deep-pocketed Internet companies, Verizon has worked to promote third-party content and services, knowing that such efforts are essential to winning and keeping customers. For example, we have established state-of-the-art LTE Innovation Centers in Waltham, Massachusetts and San Francisco, California that provide facilities, tools and assistance to innovators of all types in developing the devices and applications of tomorrow.¹⁰ Verizon does this without charge to these innovators, without claims to their intellectual property, and without any commitment that they actually use any of their developments on Verizon’s networks. Our aim is to ensure that these “garage innovators” have the resources and assistance they might otherwise lack, and consequently will develop new offerings that will benefit our customers. We also operate a venture capital business, Verizon Ventures, focused on partnering with and funding promising Internet entrepreneurs. Similarly, we have established the Powerful Answers Award program to encourage and reward those who develop new and promising approaches to the use of broadband technology to address pressing needs for education, sustainability, health care, and transportation.¹¹ Verizon also recently became the first major communications service provider

⁹ *Verizon’s Commitment to Our Broadband Internet Access Customers: Our Customers Get Everything the Open Internet Has to Offer*, <http://responsibility.verizon.com/broadband-commitment/>.

¹⁰ *See Welcome to the Verizon Innovation Program*, <http://innovation.verizon.com/content/vic/en.html>.

¹¹ *See Power Answers Award Program*, <http://www.verizon.com/powerfulanswers/award/>.

to join the Open Invention Network to promote advances in open source software. This commitment to openness has helped drive our industry-leading levels of customer satisfaction.¹²

B. Internet Openness Is Best Promoted Through A Flexible Framework Rather than Prescriptive Rules.

In promoting Internet openness and the continued evolution of services in ways that benefit consumers, the Commission should rely on a flexible approach that promotes experimentation and innovation throughout the Internet environment while protecting consumers and competition from actual harm, not on prescriptive one-size-fits-all rules. For more than 20 years, federal policy has reflected a bipartisan commitment to light-touch Internet regulation.¹³ As former FCC Chief Economist Michael L. Katz notes, “[f]lexibility has been critical to the Internet’s success.”¹⁴ This flexible approach, which allows consumer demand to drive this emerging and dynamic industry, has succeeded in unleashing extensive network investment and facilities deployment.¹⁵ For example, in reliance on the Commission’s decisions to refrain from applying utility-style regulation to new broadband networks and services, Verizon has invested

¹² Verizon ranked first in Customer Satisfaction in the J.D. Power 2013 U.S. Residential Internet Service Provider Satisfaction StudySM. See J.D. Power, *Customer Satisfaction Is High among Internet Customers Who Upgrade to Premium Speed Offerings To Boost Performance*, (Sept. 26, 2013), <http://www.jdpower.com/press-releases/2013-us-residential-internet-service-provider-satisfaction-study>.

¹³ In 1993, the Clinton Administration’s Information Infrastructure Task Force outlined guiding principles and objectives on the national information infrastructure (“NII”), such as “promoting private sector investment, through appropriate tax and regulatory policies.” The Task Force noted: “To increase the likelihood that the NII will be both interactive and, to a large extent, user-driven, government must reform regulations and policies that may inadvertently hamper the development of interactive applications.” *National Information Infrastructure: Agenda for Action* (Sept. 15, 1993), <http://clinton6.nara.gov/1993/09/1993-09-15-the-national-information-infrastructure-agenda-for-action.html>.

¹⁴ Declaration of Michael L. Katz, *Protecting and Promoting Consumer Benefits Derived from the Internet*, ¶ 3 (July 15, 2014) attached hereto as Exhibit 1 (“Katz Decl.”); see also *id.* ¶¶ 7-15.

¹⁵ See, e.g., USTelecom, *Broadband Investment*, <http://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment> (noting that, as of 2012, the broadband industry “has invested more than \$1.2 trillion dollars since 1996” and that, in 2012, the combined annual capital expenditures by wireline, wireless, and cable broadband providers reached \$68 billion); Diana G. Carew and Michael Mandel, *U.S. Investment Heroes of 2013: The Companies Betting on America’s Future*, PROGRESSIVE POLICY INSTITUTE, at 5 (Sept. 5, 2013), http://www.progressivepolicy.org/wp-content/uploads/2013/09/2013.09-Carew-Mandel_US-Investment-Heroes-of-2013.pdf (noting that Telecommunications and Cable companies invested \$50.5 billion in capital expenditures in 2012, second only to energy at \$56.1 billion).

more than \$23 billion deploying our all-fiber FiOS network, and tens of billions more deploying mobile broadband facilities. While Verizon consistently ranks among the top 2 or 3 capital investors in the United States, its competitors take similar risks by investing heavily in broadband infrastructure. Just since 2009, providers have spent nearly \$250 billion to deploy wired and wireless broadband networks.¹⁶ Today, more than 95 percent of the population has access to fixed wireline services, generally from multiple providers. Similarly, the Commission’s most recent *Mobile Competition Report* found that 82 percent of American consumers can choose from at least four mobile broadband providers, while roughly 98 percent can choose from at least two.¹⁷ And technology is advancing all the time: Wireline providers are deploying fiber deeper into their networks,¹⁸ cable-based providers are touting their rollout of DOCSIS 3.0 service,¹⁹ and mobile providers are racing to deploy 4G/LTE services²⁰ (with Verizon Wireless already offering 4G LTE to 97% of Americans) – even as they investigate new protocols that could someday give rise to 5G services. As economist Andres Lerner concludes, “[t]he current competitive environment, and massive historical and planned investments in

¹⁶ See Office of Science and Technology Policy & The National Economic Council, *Four Years of Broadband Growth*, at 5 (June 2013), available at http://www.whitehouse.gov/sites/default/files/broadband_report_final.pdf.

¹⁷ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Sixteenth Report, 28 FCC Rcd 3700, at Table 9 (2013) (“*Mobile Competition Report*”).

¹⁸ *AT&T Invests More Than \$90 Million in Arkansas Wireless and Wireline Networks in First Half of 2013* (Aug. 9, 2013), <http://www.att.com/gen/press-room?pid=24645&cdvn=news&newsarticleid=36847> (last visited July 10, 2014) (touting “Project Velocity IP” as “spurring the deployment of advanced fiber-optic connections to thousands of Arkansas businesses”); *AT&T – Upgraded DSL Winning 51% Against Cable*, FAST NET NEWS (July 12, 2013 3:08 PM), <http://www.dslprime.com/dslprime/42-d/4949-atat-upgraded-dsl-winning-51-against-cable>.

¹⁹ *DOCSIS 3.0 Market Thriving*, ZACHS EQUITY RESEARCH (Dec. 17, 2013), <http://www.zacks.com/stock/news/117193/DOCSIS-30-Market-Thriving> (last visited July 10, 2014) (noting that “[m]ajor cable TV operators in the U.S. are aggressively deploying high-speed Wideband network based on the DOCSIS 3.0 technology,” with a 14% spike in annual investment expected for 2014).

²⁰ Paul Lambert, *Successful LTE strategies: How to use LTE to build a compelling broadband strategy*, INFORMA TELECOMS & MEDIA, at 4 (July 2012), <http://www.informatandm.com/wp-content/uploads/2012/07/Successful-LTE-strategies-white-paper.pdf> (noting that “LTE is the fastest-growing cellular technology in history in terms of subscription-number growth”).

deploying broadband networks to meet consumer demands, have been achieved by relying on competitive market forces, not through rigid regulation.”²¹ Moreover, investment is on the rise: one recent report projects that wireline infrastructure spending on “last mile” and “backbone” facilities will rise from \$38.6 billion in 2013 to \$42.9 billion by 2017,²² and studies project capital expenditures by U.S. wireless broadband providers of around \$35 billion a year from 2013-2017, up from around \$25 billion a year for 2010-2012.²³ In short, the nation’s decades-long commitment to flexible Internet regulation has been a resounding success, and promises more of the same if kept in place.

While the open Internet that consumers demand is here to stay, consumers deserve the opportunity to benefit from new and additional choices in service offerings or business models that have yet to be conceived.²⁴ As Professor Katz notes, “consumers differ widely in the importance that they attach to different characteristics of their Internet experience” and “[g]iven [this] diversity of consumer preferences in the broadband user population, consumer welfare is maximized when consumers are free to choose from among a range of different types of user experiences.”²⁵ Thus, the Commission should reject proposals to mandate a one-size-fits-all approach at the expense of customer-focused innovation going forward.²⁶ Those favoring the

²¹ Lerner Decl. ¶ 23.

²² Lerner Decl. ¶ 99 (*citing* Telecommunications Industry Association, *TIA’s 2014-2017 ICT Market Review and Forecast*, at 3-46 (2014) (“*TIA ICT Market Review*”).

²³ *See* Lerner Decl. ¶ 100.

²⁴ *See id.* ¶ 2 (“[The Commission should allow] providers to explore new service offerings or business models, including differentiated arrangements with content and application providers that offer additional choices to consumers, rather than locking in place a one-size-fits-all approach. Imposing *ex ante* regulation that restricts the ability of broadband providers to experiment and deploy such business models, without a clear showing that such provider conduct harms the competitive process, would distort market outcomes, reduce investment incentives, and thereby harm consumers.”).

²⁵ Katz Decl. ¶¶ 8-9.

²⁶ *Id.* ¶ 3 (“Rules that restrict flexibility or take a one-size-fits-all approach risk distorting competition and harming innovation, investment, and consumer welfare.”), *see also id.* ¶¶ 7-15.

highly prescriptive approach proclaim the benefits of the open Internet – benefits that no stakeholder denies – but fail to demonstrate that this goal is better met by innovation-inhibiting rules than by the existing flexible approach. Notwithstanding the trillions of bits traversing the Internet every day, they can cite only a tiny handful of examples of arguable misconduct by American broadband providers since the dawn of broadband service.²⁷ They raise fears of “fast lanes” and “slow lanes,” forgetting that large Internet incumbents such as Netflix and Google already have implemented the equivalent of their own “fast lanes” that expedite the delivery of their own traffic to consumers using in-house or third-party private networks; content-delivery networks (CDNs); and even techniques such as Google’s implementation of the SPDY protocol in ways that direct certain mobile traffic accessed through the Chrome browser to Google’s proxy servers. Google’s approach directs more traffic to its network and thus allows more access for Google to end-user data. In this environment, it is small upstarts as much as anyone that could benefit from new business arrangements, which might help them compete against the Internet’s content giants.

Nor is there reason to fear that the Internet will become a digital “dirt road.” To the contrary, data tracked by the Commission and others shows that, in response to consumer demands and competitive pressures, the capabilities of broadband networks have continually increased, as domestic broadband providers outpace most international counterparts in investing

²⁷ *Preserving the Open Internet; Broadband Industry Practices*, Report and Order, 25 FCC Rcd 17905, ¶ 35 (2010) (“*Open Internet Order*”) (citing to settlement of alleged blocking by Madison River Communications, LLC and enforcement action against Comcast Corporation concerning subscriber uploads of peer-to-peer (P2P) content).

in more advanced broadband infrastructure.²⁸ For example, total capital expenditures by U.S. wireline broadband providers in 2012 equaled \$25 billion.²⁹ Per capita broadband investment in this country is roughly double that of European counterparts.³⁰ As a result, the speeds associated with today’s “best efforts” Internet service are double those of just four years ago, when the Commission last considered open Internet issues.³¹ This consistent, aggressive growth in broadband speeds ensures that the best-effort Internet will remain the principal means by which Americans access an ever-growing range of diverse content at higher speeds and with less latency or jitter than before.

²⁸ See, e.g., *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10347 ¶ 6 (2012) (“Recent trends show providers offering much higher speeds” through advances in both wireline and wireless technologies); see also Office of Engineering and Technology & Consumer and Governmental Affairs Bureau, *2012 Measuring Broadband America : A Report on Consumer Wireline Broadband Performance in the U.S.*, FEDERAL COMMUNICATIONS COMMISSION, at 4 (July 2012), <http://transition.fcc.gov/cgb/measuringbroadbandreport/2012/Measuring-Broadband-America.pdf> (finding “striking across-the-board improvements on key metrics underlying user performance”); *International Comparison Requirements Pursuant to the Broadband Data Improvement Act; International Broadband Data Report*, Third Report, 27 FCC Rcd 9884 (2012). See also, e.g., Joan Engebretson, *Akamai: Average U.S. Broadband Speed Climbs to 9.8 Mbps*, TELECOMPETITOR (Jan. 29, 2014, 1:00 AM), <http://www.telecompetitor.com/akamai-average-u-s-broadband-speed-climbs-9-8-mbps/>; Andrew Burger, *Report: Average U.S. Broadband Prices Are Below World Average of \$76.61*, TELECOMPETITOR (April 30, 2014, 7:15 PM), <http://www.telecompetitor.com/report-average-u-s-broadband-prices-are-below-world-average-of-76-61/>.

²⁹ See Lerner Decl. ¶ 100. For U.S. wireline industry providers overall one recent report projects that infrastructure spending on “last mile” and “backbone” facilities, will rise from \$38.6 billion in 2013 to \$42.9 billion by 2017. *Id.* ¶ 99, citing *TIA ICT Market Review* at 3-46.

³⁰ Christopher S. Yoo, *U.S. vs. European Broadband Deployment: What Do the Data Say?*, Center for Technology, Innovation and Competition (June 2014), <https://www.law.upenn.edu/live/files/3353-us-vs-european-broadband-deployment-summary> (last visited July 15, 2014) (“Data analysis indicates that as of the end of 2012, the U.S. approach promoted broadband investment, while the European approach had the opposite effect (\$562 of broadband investment per household in the U.S. vs. \$244 per household in Europe.”).

³¹ Compare Akamai, *Akamai State of the Internet Report Spotlights Latest Global Speed and Attack Trends from Fixed and Mobile Internet Connections* (Jan. 24, 2011), http://www.akamai.com/html/about/press/releases/2011/press_012411.html (overall average connection speed for the U.S. as a whole in the third quarter of 2010 was 5.0 Mbps and overall average peak connection speed was 20 Mbps.) with Akamai’s *State of the Internet Q4 2013 Report*, at 23 (2014), <http://www.akamai.com/dl/akamai/akamai-soti-q413.pdf> (average connection speed in the United States were 10.0 Mbps and average peak connection speeds were 43.7 Mbps.).

In contrast to the long-standing light-touch approach that has fostered these successes, a regime centered on inflexible rules would undercut the innovation and investment that characterize today’s Internet, making regulatory bodies in Washington, D.C. the new epicenter of decision-making for all things related to the Internet. The negative consequences would be especially harmful to consumers and competition if applied in the context of mobile wireless services, which, as explained further below, are still developing, are provisioned in an intensely innovative and competitive environment, and pose unique technical challenges not associated with fixed networks.³²

In particular, as addressed in Section IV below, the Commission should reject arguments by those asking it to turn the clock back by more than a century and “reclassify” broadband Internet services as including a distinct “telecommunications” component subject to common carrier regulation. This radical departure from well-established precedent would be contrary to the facts and the law.³³ Moreover, the ultra-regulatory “Title II” approach would raise the specter of rate regulation, entry and exit regulation, and a broad array of other requirements, prompting investors to withdraw capital from the communications sector (as they did when the idea was first considered in 2010).³⁴ Furthermore, because all Internet services involve some form of transmission, an approach severing an information service’s transmission component from its processing capabilities would also implicate a wide range of information service providers. For example, large Internet incumbents like Amazon and Google provide much of

³² See Katz Decl. ¶¶ 3, 62-63.

³³ See generally *infra* Section IV.E.

³⁴ See generally Cecilia Kang, *A look at how the FCC’s move can affect stocks*, WASHINGTON POST TECH BLOG (May 7, 2010, 11:07 AM), http://voices.washingtonpost.com/posttech/2010/05/a_look_at_how_the_fccs_move_ca.html (showing that, the day after Chairman Genachowski floated his “Third Way” reclassification proposal, “shares of cable and telecom stocks were trading 300 to 400 basis points lower than the overall market”).

their own transmission, and operate some of the largest networks for delivering that traffic.³⁵ All of the Internet-based services they offer consumers, including search engines, social networks, and messaging applications, also incorporate transmission. All of these offerings could be swept up into Title II's reach under any reclassification. Ironically, even as it imposed all these harms, reclassification would not even preclude the differentiation of service that its proponents seek to ban, because Title II expressly recognizes that reasonable discrimination is lawful and has long permitted many of the practices that Title II proponents criticize. Thus, the application of Title II requirements to broadband providers would amount to regulation for the sake of regulation, strapping a straightjacket onto this competitive and dynamic sector.

II. FLEXIBILITY, INNOVATION, AND CONSUMER CHOICE SHOULD GUIDE THE COMMISSION'S APPROACH, WHETHER OR NOT IT DECIDES TO ADOPT FURTHER RULES.

As evidenced by the absence of problems in the broadband marketplace to date, a regime that relies in the first instance on informed consumer choice protects broadband consumers through the very same mechanisms that protect consumers in myriad other industries: The disciplining force exerted by informed consumers making choices regarding their own best interests, backed by flexible legal protections to address bad actors in the event of market breakdowns.³⁶ “Well-informed consumers are the best judges of their own preferences.”³⁷ This

³⁵ In addition to operating its own CDN, Google is in the process of constructing a substantial last-mile presence through “Google Fiber,” which already serves several cities and may soon serve dozens more. *See, e.g.*, Lerner Decl. ¶ 33.

³⁶ *See, e.g.*, Lerner Decl. ¶ 47 (“[B]roadband consumers tend to be well informed. In the broadband industry, marketing and advertising raise consumer awareness of differences between broadband providers’ product offerings, including speed, pricing, and data caps. Broadband providers’ advertising and marketing efforts provide useful information to consumers, by comparing a given providers’ offerings with those of competitors. Additionally, industry groups and publications (e.g., Consumer Reports, J.D. Power and Associates) provide surveys and comparisons of broadband provider offerings, and report user satisfaction with various providers, allowing consumers to make informed decisions when choosing providers.”).

³⁷ Katz Decl. ¶ 9.

approach directs investment to the services that consumers demand, and thus will enhance the value of those services more effectively than regulation.

While transparency and informed consumer choice will continue to protect Internet openness and deter harmful practices on the Internet, additional safeguards do and should exist to address any new issues that may arise and to address unreasonable practices that harm competition or consumers. Indeed, the Internet ecosystem has a long and successful history of addressing problems as they arise even without regulatory involvement through multi-stakeholder processes. Groups such as the Internet Engineering Task Force, the Internet Society and others have played a valuable role in this regard and have helped to guide the evolution of Internet technology and to address emerging issues. The Broadband Internet Technical Advisory Group (BITAG) is a more recent example that provides a forum for airing concerns and addressing technical issues while avoiding the downsides of a more regulatory approach. BITAG was created to “discuss and opine on technical issues pertaining to the operation of the Internet, as a means of bringing transparency and clarity to network management processes as well as the interaction among networks, applications, devices and content.”³⁸ Aside from such multi-stakeholder groups, generally applicable antitrust and consumer protection laws also remain available to address many forms of alleged misconduct.³⁹ For example, consumer protection laws, including those administered by the Federal Trade Commission, already guard against fraud, deception, and similar practices.⁴⁰

³⁸ See BITAG, BITAG Organization, BITAG History, *available at* http://www.bitag.org/bitag_organization.php?action=history.

³⁹ See, e.g., Katz Decl. ¶ 29.

⁴⁰ Thus, no additional rules are needed to prohibit, for example, a broadband provider from affirmatively misleading consumers through a false statement about a material term related to its service or failing to provide access to all lawful content and applications if that is what the service provider has promised.

Taking into account these existing protections, the Commission can continue to play an important role in addressing unreasonable conduct should it arise. Rather than pursuing a traditional, prescriptive approach to regulation that would be ill-fitting and counterproductive for the dynamic Internet marketplace, however, the Commission could act as a “backstop,” stepping in when needed to address unreasonable actions that harm competition or consumers. This type of case-by-case, enforcement-based approach should provide the flexibility necessary to encourage experimentation and innovation, while still allowing the Commission to intervene and address practices that demonstrably harm consumers or competition.⁴¹

This proposed framework also fosters the flexibility that the *NPRM* recognizes is needed to “permit broadband providers to engage in individualized practices” that can expand consumers’ options.⁴² Flexibility to offer new products and services is key to success in the fast-paced marketplace of broadband and related Internet-based services.⁴³ For example, experimentation with new competitive offerings – such as T-Mobile’s recently announced “Music Freedom” plan, which offers users unlimited streaming of music without incurring any additional usage-based charges⁴⁴ – creates new choices for consumers and provide additional dimensions on which providers can compete. It is instructive that T-Mobile’s experiment with an approach that, on its face, gives consumers new benefits and potential savings was met with

⁴¹ See Katz Decl. ¶ 26 (describing benefits of case-by-case approach).

⁴² *Protecting and Promoting the Open Internet*, Notice of Proposed Rulemaking, GN Docket No. 14-28, FCC 14-61, ¶ 111 (May 15, 2014) (“*NPRM*”). Thus the *NPRM* focuses on “requiring broadband providers to use ‘commercially reasonable’ practices in the provision of broadband Internet access service,” an approach that is “more flexible than the vacated 2010 non-discrimination rule” and would “permit broadband providers to serve customers and carry traffic on an individually negotiated basis.” *Id.* ¶ 116.

⁴³ See Katz Decl. ¶ 13.

⁴⁴ See <http://www.t-mobile.com/offer/free-music-streaming.html>.

knee-jerk hostility from some net neutrality proponents.⁴⁵ Flexibility to test the appeal of such offerings in the competitive marketplace does not undercut Internet openness.⁴⁶ Regardless of what innovations may ultimately come to pass or be embraced by consumers, today's consumers have made clear that they expect and demand access to whatever lawful content, applications, and services they choose, whenever they want it. And Verizon and other broadband providers have committed to meeting these consumer demands and expectations.

To the extent the Commission does adopt new rules governing the broadband marketplace; moreover, it should ensure that those rules apply in an even-handed way that promotes innovation across the ecosystem. Large Internet incumbents such as Google,⁴⁷ Netflix,⁴⁸ and Amazon have undeniable power to affect the consumer experience online and Internet openness, and the reach of these companies often dwarfs that of particular ISPs. For example, Google exercises pervasive influence over consumers' Internet usage: It controls more

⁴⁵ See, e.g., John Eggerton, *T-Mobile Criticized for Online 'Music Freedom' Move*, BROADCASTINGCABLE.COM (June 20, 2014 12:19 PM), <http://www.broadcastingcable.com/news/washington/t-mobile-criticized-online-music-freedom-move/131915>.

⁴⁶ See Katz Decl. ¶¶ 7-15.

⁴⁷ Trouncing the market share of any provider in the national broadband services marketplace, Google's share of the search market is nearly 68 percent. See Ashley Zeckman, *Google Search Engine Market Share Nears 68%*, SEARCH ENGINE WATCH (May 20, 2014), <http://searchenginewatch.com/article/2345837/Google-Search-Engine-Market-Share-Nears-68> (last visited July 10, 2014). Google's practices related to search and other activities have an undeniable impact on consumers' experience on the Internet.

⁴⁸ Netflix now boasts more than 48 million subscribers. See Brian Solomon, *Green Is The New Black: Netflix's Reed Hastings Joins Billionaire Ranks*, FORBES INVESTING BLOG (Jun. 9, 2014, 2:38 PM), <http://www.forbes.com/sites/briansolomon/2014/06/09/netflix-ceo-reed-hastings-joins-billionaire-ranks/>. That is nearly 10 times the number of current Verizon FiOS subscribers, and more than five times the number of current Verizon wireline broadband connections. See *Verizon Reports Fifth Consecutive Quarter of Double-Digit Operating Income and Earnings Growth: 1Q 2014 Highlights* (Apr. 24, 2014), http://www.verizon.com/investor/news_verizon_reports_fifth_consecutive_quarter_of_doubledigit_operating_income_and_earnings_growth_042420.htm. Netflix's subscribership is also more than four times the number of U-verse high-speed customers reported by AT&T. See *AT&T Reports Strong Results in First Quarter while Investing in Growth Transformation*, http://about.att.com/story/att_first_quarter_earnings_2014.html (Apr. 22, 2014) (reporting 11 million U-verse high-speed Internet customers).

than two-thirds of the American search market,⁴⁹ exercising tremendous discretion over the ordering of search results and thus over which websites Americans visit. It likewise controls the distribution of content over its extensive and quickly expanding network plant. And by directing more traffic to its own proxy servers as part of Google’s implementation of the SPDY protocol, it is promoting further customer reliance on its network, and capitalizing on that reliance to harvest more information regarding its users’ behavior.

Similarly, Netflix boasts of its power in the Internet ecosystem: Its website states that “[t]he more successful Netflix becomes, the more important we are to the ISPs’ subscribers,” and that “[i]t is natural for ISPs to worry that we may try to charge them in the future like linear TV networks charge MVPDs.”⁵⁰ Indeed, even aside from the popularity of Netflix with millions of Internet users, the volume of Netflix’s traffic – more than one-third of all U.S. Internet traffic during peak times, according to one recent study – gives Netflix significant power to affect how the Internet operates and the consumers’ Internet experience.

Amazon exercises similar control over large swaths of the consumer Internet experience, given the central role of its site in online commerce, the popularity of its consumer devices such as the Kindle, and its cloud-based services. Amazon has even begun to limit customers’ ability to purchase content from publishers that do not agree to its ebook pricing mechanism.⁵¹

Under these conditions, it would defy logic to focus only on an ISP’s alleged “incentives and abilities,” but to ignore the roles played by other Internet companies. To be effective and to avoid distorting competition, efforts to promote openness must apply to all relevant segments of

⁴⁹ See Todd Bishop, *Google’s market share climbs in latest U.S. search stats*, GEEKWIRE (Jan. 15, 2014, 2:14 PM), <http://www.geekwire.com/2014/googles-market-share-climbs-latest-u-s-search-stats/>.

⁵⁰ See *Netflix Long-Term View*, <http://ir.netflix.com/long-term-view.cfm> (last updated Apr. 21, 2014).

⁵¹ See, e.g., Carolyn Kellogg, *Amazon and Hachette: The dispute in 13 easy steps*, LOS ANGELES TIMES (June 3, 2014, 4:03 PM), <http://www.latimes.com/books/jacketcopy/la-et-jc-amazon-and-hachette-explained-20140602-story.html#page=1>.

the market. This is not to say that extensive regulation is needed in any corner of the Internet ecosystem at this point—there is no evidence that it is—but instead that whatever regulatory backstop is deemed appropriate should account for the power exercised by all players in the Internet ecosystem.

A. Any Additional Transparency Requirements Must Be Reasonable and Limited to the Disclosing ISP's Own Network.

In the competitive broadband marketplace, the Commission's transparency requirement can be and should be the linchpin in its open Internet policy framework. Appropriately framed disclosures promote market interactions by ensuring that consumers understand the strengths and weaknesses of competing offerings and can choose the ones best suited to their needs.⁵² Thus, transparency enables consumer choice, a strong force for ensuring that the Internet remains open.⁵³ When consumers have useful information regarding the services available to them and can make choices based on that information, additional prescriptive rules are unnecessary. The Commission should continue to leverage transparency and consumer choice as means of identifying and preventing practices that could harm consumers or competition.

Verizon provides customers with extensive information regarding our service offerings and network management practices, and other ISPs appear to do the same. Indeed, given the power of consumer demand in the broadband marketplace,⁵⁴ providers have every reason to disclose relevant information about their efforts to promote an open Internet (not to mention the other capabilities of their advanced networks) and thereby win customers, absent any

⁵² See Katz Decl. ¶ 20 (“Transparency regarding available service offerings and network management practices can promote competition and consumer welfare by allowing consumers to make better-informed choices.”).

⁵³ See, e.g., Katz Decl. ¶ 9 (“Well-informed consumers are the best judges of their own preferences. Given the diversity of consumer preferences in the broadband user population, consumer welfare is maximized when consumers are free to choose from among a range of different types of user experiences.”).

⁵⁴ See *supra* Section I.B.

government mandates.⁵⁵ However, the Commission must ensure that its disclosure mandates do not become unduly complex and burdensome, such that they impose substantial costs without providing any commensurate benefits.

The current disclosure rule is designed to elicit a broad range of detailed information relevant to consumers, edge providers, and other stakeholders. The 2010 *Open Internet Order* and the subsequent “advisory guidance” issued by the Office of General Counsel and the Enforcement Bureau list numerous data points that broadband providers must disclose to customers and edge providers, including the following:

- ***The provider’s network practices***, including congestion management, application-specific behavior, device attachment rules, security measures, the types of traffic subject to such practices, the purposes served by them, the practices’ effects on end users’ experience, and the criteria used to effectuate such practices;
- ***The service’s performance characteristics***, including a general description of system performance (such as speed and latency); its suitability for real-time applications; the effects of specialized services on available capacity; usage limits and the consequences of exceeding them; and whether and why the provider blocks or rate-controls specific protocols or protocol ports, modifies protocol fields in ways not prescribed by the protocol standard, or otherwise inhibits or favors certain applications or classes of applications;
- ***Commercial terms associated with the service***, including pricing, termination fees, privacy policies, and redress options.⁵⁶

In several places, the *NPRM* suggests more disclosures are needed, but then describes information that is already covered by the existing rule. The *NPRM*’s discussion of customer disclosures indicates that some customers need information concerning such topics as their services’ speeds, the charges that will be applied, the sources of network congestion, or limits

⁵⁵ See, e.g., Lerner Decl. ¶ 49; see also *id.* at n.53.

⁵⁶ See generally *Open Internet Order* ¶ 55; *FCC Enforcement Bureau and Office of General Counsel Issue Advisory Guidance for Compliance With Open Internet Transparency Rule*, Public Notice, 26 FCC Rcd 9411 (2011).

imposed as a result of “excessive use.”⁵⁷ Elsewhere, it asks whether broadband providers should be required to disclose “data caps.”⁵⁸ Each of these examples relates to information that providers must *already* disclose under the existing rule. If they are not doing so, the proper response is to ensure compliance with the existing mandates, not to add unnecessary detail to them or to create *new* mandates.

The *NPRM* also asks whether broadband providers should be required to disclose “effective download speeds, upload speeds, latency, and packet loss.”⁵⁹ While providers already disclose much of this information, they necessarily do so in ways that account for the many factors affecting performance, many of which are outside of the control of the provider. Mandatory disclosures at the level of specificity suggested in the *NPRM*, however, could limit provider flexibility, resulting in disclosures that were confusing, misleading, or both. On the “best efforts” Internet, a particular service’s speed, latency, jitter, and other core characteristics will vary based on a large array of factors, including the number of users accessing shared network resources and the type of content being accessed. There would be no way to report this information concisely, and such disclosures would be meaningless to all but the most technically sophisticated customers. Worse, given the *NPRM*’s assumption that “consumers have difficulty understanding commonly used terms associated with the provision of broadband services,”⁶⁰ such disclosures would simply deter consumers from reviewing the information provided, eviscerating the rule’s effectiveness.⁶¹

⁵⁷ See *NPRM*, ¶ 69.

⁵⁸ *Id.* ¶ 72.

⁵⁹ *Id.* See also *id.* ¶ 73 (asking whether ISPs should be required to report on “packet loss, packet corruption, latency, and jitter in addition to upstream and downstream speed”).

⁶⁰ *Id.* ¶ 68.

⁶¹ See Katz Decl. ¶ 22 (“There is a risk that some of the information the Commission seeks to make available may be unintelligible to most end users.”).

Likewise, a rule mandating disclosure of even more information – whether to customers, edge providers, or other stakeholders – could limit broadband providers’ ability to implement innovative new network-management tools and security protocols, because it would require them first to describe any new practices to consumers and edge providers – and, by extension, to competitors, hackers, spammers, and others wishing to exploit the network’s weaknesses. Broadband providers will naturally be averse to disclosing information that is competitively sensitive or that exposes their networks and customers to external threats. Thus, excessive disclosure requirements could have the perverse effect of retarding the network’s evolution by deterring the deployment of new tools designed to help consumers.

Finally, if it chooses to impose additional transparency requirements, the Commission must ensure that obligations falling on broadband service providers relate only to the last-mile networks that those providers operate, and *not* to the networks of third parties. The *NPRM* “tentatively conclude[s] that [it] should require that broadband providers disclose meaningful information regarding the source, location, timing, speed, packet loss, and duration of network congestion.”⁶² At the same time, the Commission acknowledges that “sources of congestion that impact end users may originate beyond the broadband provider’s network or in the exchange of traffic between that network and others.”⁶³ This is true: Content providers and the backbone networks on which they (and their own last-mile providers) rely make many choices regarding how to route traffic,⁶⁴ and those choices affect congestion and the speed at which customers are

⁶² *NPRM* ¶ 83.

⁶³ *Id.* ¶ 82.

⁶⁴ *See infra* Section V.A.

able to access content.⁶⁵ Last-mile broadband providers cannot control what happens beyond their networks, or how content providers choose to reach ISPs' networks. Moreover, if an ISP's end user accesses content that has already been degraded by congestion before reaching the ISP's network (for example, on the network of a transit provider, a peering partner, or the last-mile network serving the content provider), the ISP will have no way of determining the source of that degradation.⁶⁶ Under these circumstances, disclosures regarding congestion could create the misleading impression that the ISP *caused* congestion, even when other network providers and their choices are responsible for the issue.⁶⁷ Thus, any new disclosure requirements addressing the sources of congestion must be appropriately cabined to ensure that ISPs are only responsible for reporting on the sources of congestion on their own last-mile networks.

B. Any New No-Blocking Rule Should Ensure No Blocking of Content on the Customer's Selected Tier of Service But Should Allow Flexibility for Additional Differentiated Services.

Verizon is fully committed to delivering the content and applications that our customers demand regardless of the identity of the edge provider involved, and will not block any lawful Internet traffic as customers use their selected tier of broadband Internet access service. As explained above, Verizon has publicly committed to our customers that, on any of our Internet

⁶⁵ See Katz Decl. ¶ 23 (“the Commission’s transparency rule should be properly cabined to ensure that broadband Internet access providers are responsible for reporting only on the sources of congestion for which they are responsible, while recognizing that the decisions and practices of others in the Internet ecosystem likewise affect performance and end users’ experiences”).

⁶⁶ For example, a researcher studying Netflix’s speed index rankings recently concluded that the ranking primarily reflected a range of factors unrelated to particular broadband providers’ networks, including a number of factors within Netflix’s control. See Peter Sevcik, How the Netflix ISP Speed Index Documents Netflix Congestion Problems, NETFORECAST (June 2014), http://www.netforecast.com/wp-content/uploads/2014/06/NFR5117_How_the_Netflix_ISP_Speed_Index_Documents_Netflix_Congestion_Problem_s.pdf.

⁶⁷ See Katz Decl. ¶ 23 (“To require broadband Internet access providers to disclose performance information unrelated to their own facilities or services is potentially misleading to consumers.”). Nor can ISPs be expected to identify alternative sources of congestion – any such “disclosure” would either reflect pure guesswork or require the ISP itself to investigate the numerous networks that might be causing the problem. This would, of course, be untenable.

access services, users “can access and use the legal content, applications, and services of [their] choice, regardless of their source,” and can connect their “choice of technically compatible devices,” so long as the content or devices at issue “do not harm our networks or the provision of Internet access service, facilitate theft of service, or harm other users of the service.”⁶⁸

Consistent with these promises, Verizon does not block or degrade any content or application within our Internet access services on the basis of the views expressed, the source of the traffic or identity of the content provider, or the extent (if any) to which the content or application competes with a Verizon service offering. Verizon’s customers demand and desire open Internet services, and value Verizon’s services precisely because they afford access to all the lawful content and applications the Internet makes available. A policy of impeding access to services customers wish to access would only push those customers to other providers. Other ISPs face the same incentives. Under these circumstances – in which users demand access to all lawful content and ISPs are committed to fulfilling customers’ needs – there is no need for a prescriptive no-blocking rule.

To the extent that the Commission nonetheless decides to adopt a no-blocking rule, the best regulatory framework would be a rule that prohibits providers from blocking or degrading traffic within the customer’s chosen level of best efforts Internet access service based on who sent it: if a customer buys a generic Internet access service offering download speeds of up to 50 Mbps, then Internet traffic from the provider’s affiliates or partners cannot be specially provisioned to travel at 50 Mbps while traffic from other edge providers travels only at 25 Mbps. Instead, all Internet traffic, regardless of who sent it, should get the same best efforts treatment

⁶⁸ See *Verizon’s Commitment to Our Broadband Internet Access Customers*, *supra* n.10.

within the customer's Internet service.⁶⁹ With this approach, customers are assured that they can use their best efforts Internet service to go where they want and do what they want online, and edge providers have the comfort of knowing that they will not be disadvantaged within the last mile and will have access to their customers.⁷⁰

As today, this approach would mean that there would be no necessity for any edge provider to seek out and enter into individual arrangements with broadband providers in order to reach their customers. At the same time, and consistent with the approach discussed by the D.C. Circuit in *Verizon*, edge providers, content providers, or others would have the flexibility to negotiate differentiated arrangements with broadband providers if they believe they can provide a service customers may want.⁷¹ Thus, all of the benefits of the traditional approach would remain intact, while consumers potentially could gain additional choices and edge providers could pursue alternative ways to distinguish themselves in the competitive marketplace.

This approach also would best account for evolving levels of service. Whereas a Commission-imposed standard would either be static or require constant revision, a framework based on ensuring that customers can use their selected tier of best efforts Internet access service to go where they want and do what they want online will evolve on its own.⁷² Broadband speeds have consistently increased, and continue to do so at a rapid pace, as consumers demand.

For example, 51 percent of Verizon FiOS Internet customers as of March 2014 subscribed to

⁶⁹ Thus, at times when that customer's Internet service is providing 50 Mbps over her connection, any Internet content that the subscriber selects should get the full benefit of that speed over that last mile connection. And if for whatever reason only 40 Mbps is available for the customer's Internet service at a particular point in time based on the myriad factors that can affect performance, again, that would be true regardless of the source of the Internet traffic the subscriber seeks.

⁷⁰ See Katz Decl. ¶ 32 ("A carefully crafted rule that ensures that traffic will not be blocked or degraded over an end user's best-effort Internet access service would provide assurances that end users could access the content and applications that they desire and that edge providers would continue to have a path to reach end users.").

⁷¹ *Verizon v. FCC*, 740 F.3d 623, 657 (2014).

⁷² See Katz Decl. ¶ 33.

FiOS Quantum, which offers speeds of 50 Mbps downstream/25 Mbps upstream or faster.⁷³

Mobile broadband speeds continue to increase as well: In May, Verizon announced the rollout of XLTE, which “delivers faster peak data speeds and a minimum of double the bandwidth to 4G LTE customers in high traffic areas in markets nationwide where AWS spectrum has been activated.”⁷⁴ The approach suggested above would reflect these changes as they occur, rather than leave outdated standards in place while the Commission repeatedly works to update them.

This “consumer choice” framework for a no-blocking rule would be superior to one focused on quantitative performance criteria.⁷⁵ Efforts to enumerate “specific technical parameters,” such as “specific speeds of service” or specific outcomes that must be avoided (e.g., high jitter rates), would be doomed to failure: The capabilities of broadband networks are constantly evolving, as are the needs of consumers. As the *NPRM* acknowledges, “a specific technical definition of minimum access could become outdated as available broadband network technologies change and available broadband speeds improve.”⁷⁶ Moreover, different platforms present different strengths and limitations, further complicating any effort to establish performance benchmarks. Even if the Commission could identify relevant technical criteria, adoption of such criteria would impose a one-size-fits-all solution on a diverse marketplace.

An approach that forbade ISPs from blocking any lawful Internet traffic as customers use their selected Internet access service would solve these problems: Evolving capabilities and demands would be reflected by the market and by evolving service arrangements, such that the

⁷³ See *TV Redefined: Verizon Brings FiOS Quantum TV Service to Maryland, Virginia and D.C.* (May 20, 2014), <http://newscenter.verizon.com/corporate/news-articles/2014/05-20-fios-quantum-tv-md-va-dc/>.

⁷⁴ See Verizon, *XLTE: America’s Best Network Gets Even Better* (May 19, 2014), <http://www.verizonwireless.com/news/article/2014/05/verizon-wireless-xlte.html>.

⁷⁵ See *NPRM* ¶ 103.

⁷⁶ *Id.*

best efforts level of service purchased by the consumer would itself evolve over time. Differences between platforms would be reflected in the services purchased by customers. Customers would not be subject to one-size-fits-all standards, but rather would benefit from knowing that their traffic would not be blocked.

This approach to a no-blocking rule would also be superior to the *NPRM*'s "reasonable person" standard.⁷⁷ The "reasonable person" standard would substitute the Commission's view of what consumers expect for the choices made by *actual consumers*. This result would reduce consumer welfare, because different customers have different preferences. "It is not possible to predict consumer demand, or the types of business models that undoubtedly will emerge. As a result, a one-size-fits-all approach is likely to deny consumers choices that they may otherwise find attractive."⁷⁸ There is no reason for the Commission to try to divine what a hypothetical "reasonable consumer" might expect in terms of service or mandate such a one-size-fits-all approach when consumers are making actual, observable choices every day about the levels of service they require, and different "reasonable" consumers use the Internet in very different ways.

C. Any Commercial Reasonableness Standard Should Allow Flexibility for Pro-Consumer Innovation and Experimentation.

An approach that relies on informed consumer choice subject to protections against blocking would be ineffective if the Commission nevertheless prohibited broadband providers from providing the services that consumers demand. Any rules that the Commission adopts to regulate broadband providers' services, therefore, should allow ample flexibility to foster

⁷⁷ See *id.* ¶ 104.

⁷⁸ Lerner Decl. ¶ 26; see also Katz Decl. ¶¶ 8-15.

consumer choice and drive pro-consumer innovation.⁷⁹ As Professor Katz notes: “Because no one has the ability to predict what will be the best network management practices and pricing and service models in the future, it is important that the Commission’s rule be flexible and remain focused on addressing only those practices that demonstrably harm competition. A case-by-case (or rule-of-reason) approach can offer that flexibility.”⁸⁰ In this respect, the Commission’s balanced proposal for a commercial reasonableness standard is on the mark. The Commission strikes the right balance by proposing to allow flexibility for broadband providers to develop new alternatives that consumers and edge providers might want, while still preserving the ability to address specific practices that are determined to be anticompetitive or harm consumers.⁸¹

In order to allow experimentation with additional service offerings or business models and preserve individualized negotiations with other players in the Internet ecosystem, any commercial reasonableness rule must be truly open to tailored arrangements that help fixed broadband providers adapt their services to consumer choices, so long as there is no harm to competition or consumers. This kind of experimentation with individualized agreements offers the potential to initiate new “virtuous circles” that can benefit consumers, edge providers, and broadband providers alike. For example, many such arrangements could reduce consumer costs, whether through tiered pricing, ad-supported services, 800-type “sponsored data” services, two-

⁷⁹ See Lerner Decl. ¶ 108 (“Differential network management and pricing arrangements have the potential to generate significant benefits for consumers, competition, and innovation.”); *id.* ¶ 2 (“Imposing ex ante regulation that restricts the ability of broadband providers to experiment and deploy such business models, without a clear showing that such provider conduct harms the competitive process, would distort market outcomes, reduce investment incentives, and thereby harm consumers. This is particularly true given the rapidly changing and dynamic nature of the industry, and the significant uncertainty concerning the services and business models that will best serve consumers going forward.”).

⁸⁰ Katz Decl. ¶ 36.

⁸¹ *Id.* ¶ 111.

sided market arrangements or other sophisticated approaches to pricing.⁸² Some providers trying to distinguish themselves in the competitive broadband marketplace already have begun experimenting with such arrangements. T-Mobile’s Music Freedom plan, which exempts music services from subscribers’ monthly data allowances, could benefit consumers who frequently stream music. AT&T’s new sponsored data program likewise permits consumers to access sponsored content without having that associated usage count against their monthly data allowance.

Such flexibility to experiment with alternative arrangements not only can reduce costs to end users while allowing them to access the content they demand, but also benefit edge providers and spur continued investment in broadband infrastructure.⁸³ Differentiated arrangements help content and edge providers distinguish themselves in the marketplace, as T-Mobile is trying to do, and tailor their services to consumer demands. Indeed, the flexibility created by differentiated arrangements allows content and edge providers to adapt their services quickly in a competitive marketplace. And from the perspective of broadband providers, such arrangements could help fund the ongoing heavy costs of infrastructure deployment and upgrades without increasing costs to consumers. Given the potential benefits all around, such arrangements should be permissible and should be tested in light of consumer demand rather than resolved through regulatory wrangling. As explained below, allowing such arrangements would not foreclose the Commission’s ability to address particular harmful practices on an appropriate record.⁸⁴

An approach allowing meaningful flexibility for arrangements in addition to customers’ selected Internet access service would also help the Commission’s rules to pass legal muster. In

⁸² See also Katz Decl. ¶¶ 54-61.

⁸³ See Katz Decl. ¶ 56 (noting that rationale for differentiated arrangements “is competition on the merits”).

⁸⁴ *Infra* Section II.D.

upholding the Commission’s data roaming rules, the D.C. Circuit explained in *Cellco* that the Commission cannot “in practice” “relegate[] [broadband providers] to common carrier status.”⁸⁵ The Court emphasized two keys to avoiding common-carrier restrictions. First, any rule must leave “substantial room for individualized bargaining and discrimination in terms”⁸⁶—a commercial reasonableness rule cannot amount to a duty to “hold out facilities *indifferently* for public use.”⁸⁷ Second, the Commission should leave “considerable flexibility for providers to respond to the competitive forces” of the market.⁸⁸ The data roaming rules, the Court concluded, “ensure[d] providers more freedom from agency intervention”⁸⁹ than the *pro tanto* common carriage restrictions invalidated in *Midwest Video II*, which “delimit[ed] what [providers could] charge for access and use of equipment.”⁹⁰ The Court concluded by observing that “the Commission would . . . do well to ensure that the discretion carved out in the rule’s text remains carved out in fact.”⁹¹ Prescriptive rules that reduce flexibility thus would not be appropriate. In order to ensure general flexibility, therefore, any commercial reasonableness standard must, in practice, “differ materially” from common carriage.⁹² As the D.C. Circuit made clear in *Verizon*, even common carriers traditionally had the right to turn away business due to technological constraints, economic or technical unfeasibility, and the like, and broadband providers must have

⁸⁵ *Cellco P’ship v. FCC*, 700 F.3d 534, 547 (D.C. Cir. 2012) (alteration omitted).

⁸⁶ *Id.* at 548.

⁸⁷ *FCC v. Midwest Video Corp.*, 440 U.S. 689, 706 n.16 (1979) (emphasis added) (“*Midwest Video II*”).

⁸⁸ *Cellco*, 700 F.3d at 548; see *Verizon v. FCC*, 740 F.3d 623, 657 (2014) (invalidating the *Open Internet Order*’s anti-discrimination rule partly for lack of flexibility).

⁸⁹ *Cellco*, 700 F.3d at 548.

⁹⁰ *Id.* at 547, quoting *Midwest Video II*, 440 U.S. at 702.

⁹¹ *Cellco*, 700 F.3d at 549.

⁹² *Id.* at 547.

at least as much flexibility to decline to enter into differentiated arrangements.⁹³ If parties cannot reach an agreement, for example, that should be permissible so long as the broadband provider acts in a commercially reasonable manner and continues to provide the requisite tier of Internet access service selected by the customer.

Using safe harbors and rebuttable presumptions would be another way to ensure a proper distance between the Commission’s commercial reasonableness standard and common carriage and provide greater certainty in this area. “Unless clear and meaningful safe harbors or presumptions are identified, a rule prohibiting “commercially unreasonable” practices could distort and discourage network management, innovative pricing, and other business practices that would otherwise benefit consumers.”⁹⁴

One such area where a safe harbor or presumption of reasonableness is appropriate is in the case of non-exclusive arrangements with unaffiliated third parties. As a general matter, such arrangements are unlikely to harm consumers or competition, and the Commission should presume that such arm’s length arrangements are reasonable. As Professor Katz notes: “If a deal is offered on a non-exclusive basis, then other edge providers can avail themselves of that deal if they believe it will allow them to better differentiate their services or in some other way compete more effectively. The non-exclusivity would ensure that the Internet access provider could not ‘leverage’ any market power that it might possess to harm competition in the relevant market for edge provider services.”⁹⁵ Non-exclusive agreements with unaffiliated third-parties help providers better adapt to consumer demand and only help, not harm competition.

⁹³ See *Verizon*, 740 F.3d at 657 (discussing *NARUC v. FCC*, 525 F.2d 630, 641 (D.C. Cir. 1976) (“*NARUC I*”).

⁹⁴ Katz Decl. ¶ 3.

⁹⁵ *Id.* ¶ 51.

In addition, the Commission should address other specific areas where safe harbors would be especially appropriate. Sponsored data and other arrangements that address only pricing, for example, do not result in differential treatment of traffic over a customer’s connection. But such arrangements could make service cheaper for end-users, enabling them to access more content when and where they want it, and could provide a way for interested content providers to promote or encourage use of their services.⁹⁶ These and other arrangements that do not entail the differential handling of traffic over the last mile – the main concern raised by supporters of net neutrality regulation – should be presumed lawful.⁹⁷ “The Commission should not intentionally or unintentionally create barriers to such pricing by leaving it under a cloud of regulatory uncertainty. Instead, the Commission should declare two-sided pricing to be presumptively reasonable. Moreover, this presumption should be rebuttable only if the challenging party can prove concrete harm to competition from the specific practice being challenged.”⁹⁸

The Commission’s presumptions likewise should take into account the important effect of competition on preventing anti-consumer or anticompetitive conduct. As Professor Katz notes: “In areas where consumers can choose among competing broadband Internet access providers—particularly if more than one provider is offering very-high-speed access services—there is less concern that an access provider will adopt policies that harm competition among edge providers because attempts to do so may trigger consumers to switch access providers. In addition to having less concern about the competitive effects of differentiated arrangements, there is greater concern that regulation will impose costs by reducing flexibility and discouraging

⁹⁶ See *id.* ¶¶ 54-61 (explaining consumer and competitive benefits of two-sided pricing).

⁹⁷ See Lerner Decl. ¶ 110 n.157.

⁹⁸ Katz Decl. ¶ 55.

experimentation.”⁹⁹ Similarly, practices undertaken by providers in competitive marketplaces – or practices previously found by the Commission to be commercially reasonable – should be presumed reasonable.¹⁰⁰

Finally, as explained below, if the Commission had a firm basis to conclude that particular types of arrangements would harm consumers or competition, it could consider a rebuttable presumption that such agreements are commercially unreasonable.¹⁰¹

In addition to such safe harbors and presumptions, any test for commercial reasonableness should allow flexible consideration of whether a provider’s decision to enter a particular differentiated arrangement (or not) causes any anti-competitive effects or harm to consumers, just as in the data roaming context.¹⁰² Although Internet access is a different service, certain factors relied on in the data roaming context also apply here and would help to ensure that any new rule remains within the bounds of *Cellco*.¹⁰³ By way of illustration, key factors under a commercial reasonableness standard for fixed broadband might include:

- the technical feasibility of entering into a differentiated service offering for the content, application, service, or device for which it is requested;¹⁰⁴
- whether there are other options for securing a differentiated service offering from other providers of broadband Internet access service;
- the existence of widely adopted industry practices or applicable best practices or standards adopted through multi-stakeholder groups;¹⁰⁵ and

⁹⁹ *Id.* ¶ 52.

¹⁰⁰ *Id.* ¶ 53.

¹⁰¹ *See infra* Section II.D.

¹⁰² *See* Katz Decl. ¶¶ 37-40.

¹⁰³ *See Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd 5411, ¶ 86 (2011) (“*Data Roaming Order*”); *Verizon*, 740 F.3d at 657; *Cellco*, 700 F.3d at 548.

¹⁰⁴ *See* Katz Decl. ¶ 39.

¹⁰⁵ *Id.* ¶ 40.

- the impact of the terms and conditions on the incentives for a provider of broadband Internet access service to invest in facilities and coverage, services, and service quality.

The ultimate touchstone, however, should be broadband providers' flexibility "to respond to the competitive forces" of the broadband Internet access service market, so long as their actions do not harm competition or consumers.¹⁰⁶ The Commission should reject regulations that would inhibit innovation and investment and supplant the protections of the market in favor of static and prescriptive rules. Technology, consumer needs, and business models are evolving at lightning speed, and any effort to draft rules based on today's circumstances inevitably would backfire. A mandate dictating permissible forms of service differentiation, for instance, would be outdated upon adoption because new technologies, service offerings, and demands would quickly shift understandings of what was reasonable and how consumer needs would best be met going forward.

D. Under the Proposed Commercial Reasonableness Rule, the Commission Could Address Particular Practices That Harm Consumers or Competition.

Under the Commission's proposed approach, the Commission could address particular practices that harm competition or consumers so long as it also allows sufficient flexibility for broadband providers to develop other differentiated arrangements. Indeed, the Commission can address practices that harm consumers or competition under the appropriate record without necessarily straying into impermissible common carriage or taking the radical step of "reclassification."

To take one example that has received much public attention, some parties have raised concern about the potential harms of "paid prioritization" arrangements. If the Commission were to determine that certain types of paid prioritization do, in fact, harm competition or consumers,

¹⁰⁶ *Cellco*, 700 F.3d at 548.

it could prohibit such arrangements without straying into impermissible common carriage so long as it left adequate room for other types of differentiated arrangements.

Just because the Commission could prohibit such practices in some contexts, does not mean that it should do so at the present time and instead could wait to see whether any such theorized harms actually materialize. Again to return to the example of paid prioritization, notwithstanding the recent attention, it is far from clear that there is a problem to be addressed. To place this in context, neither Verizon nor any other broadband providers of which we are aware has introduced any form of paid prioritization arrangement to date, nor expressed a public interest in doing so. Verizon has no plans for such a service, and it is unclear – particularly given the widespread use of CDNs and other innovative technical means to ensure high-quality transmission of content and the ever-improving capabilities of broadband networks – that there would be much benefit to most Internet traffic from prioritization, particularly for the “big guys” on the Internet. To improve service for their customers, large Internet providers and others have already, in effect, created “fast lanes” for themselves through these alternative means such as their own private networks and CDNs. The light-touch approach encouraged the development of CDNs and similar ways to improve service for consumers and facilitate additional types of Internet traffic. But in light of such existing approaches, many of the big Internet players are unlikely to have much interest in paying for prioritization even if that were an available option and the potential beneficiaries would more likely be smaller Internet players looking to compete against such incumbents.

Likewise, there has not been a material level of demand for prioritization for typical subscribers’ Internet usage thus far. That is because, while prioritization is potentially useful in particular contexts – where, for instance, there is a need for especially low latency – it does not

provide much benefit for most Internet traffic. This becomes all the more true as the capabilities of last-mile facilities improve and as content providers and others rely more heavily on innovative arrangements such as content delivery networks, localized content storage and other similar approaches that improve the speeds and performance with which content reaches subscribers. In addition, best efforts broadband Internet access is becoming consistently faster and cheaper.¹⁰⁷ Under these circumstances, where the prospect and effects of a practice are unclear, a wait-and-see approach is preferable.

To the extent that the Commission still has concerns about paid prioritization, however, it could address particular practices without impermissibly imposing common carriage or taking the dangerous step of “reclassifying” broadband, so long as it leaves room for other individualized arrangements. On an appropriate record demonstrating that certain paid prioritization practices have clear anti-competitive or anti-consumer effects, the Commission even could create a rebuttable presumption that those specific practices are unreasonable – without lapsing into common carriage. The key would be to retain other types of individualized agreements beyond paid prioritization, such as sponsored data, two-sided pricing, or other benign arrangements.

III. ADDITIONAL REGULATION IS ESPECIALLY UNWARRANTED IN THE MOBILE BROADBAND MARKETPLACE, WHICH PRESENTS UNIQUE CIRCUMSTANCES AND IN WHICH AMERICA LEADS THE WORLD.

As the Commission has previously recognized, mobile broadband presents special considerations warranting an especially flexible approach to open Internet rules.¹⁰⁸

¹⁰⁷ *Supra* n. 33.

¹⁰⁸ *See Open Internet Order* ¶ 94.

A. Unique Features Distinguish Mobile Broadband Service from Fixed Broadband Service.

Mobile wireless broadband services are provisioned in an especially innovative and competitive environment – one that is still developing quickly – and present unique technical challenges that distinguish them from fixed broadband offerings.

Mobile wireless broadband services are rapidly developing. Since 2010, the mobile broadband market has continued to evolve at breakneck speed as providers invest billions of dollars in their wireless networks, prompting developers of applications and devices to respond with new offerings to take advantage of those enhanced network capabilities.¹⁰⁹ The results speak for themselves: By mid-2013, the share of Americans with access to wireless broadband download speeds of greater than 10 Mbps had increased to over 95 percent,¹¹⁰ and increased bandwidths have led to newer and better applications. Apple’s App Store and Google Play currently both offer over one million apps for consumers to download for iOS and Android mobile devices respectively.¹¹¹ Since the release of the 2010 *Open Internet Order*, the wireless industry has seen a staggering increase in data consumption, driven by the widespread deployment of 4G service.¹¹² Verizon has already matched its 3G footprint and offers 4G service to more than 300 million Americans. We recently took steps to significantly increase capacity in

¹⁰⁹ See *Ericsson Mobility Report*, at 10-12 (Nov. 2013), <http://www.ericsson.com/res/docs/2013/ericsson-mobility-report-november-2013.pdf> (“*Ericsson Mobility Report*”); CTIA, *The U.S. Wireless Industry: Leading the World in Investment, Value, Innovation, and Competition*, at 15-16 (Nov. 2013) (“*Leading the World*”), attached to Letter from Scott K. Bergmann, CTIA, to Hon. Thomas E. Wheeler, *et al.*, FCC, GN Docket No. 09-51, WT Docket No. 13-135 (Nov. 13, 2013).

¹¹⁰ See Lerner Decl. ¶ 82, citing Federal Communications Commission National Broadband Map, <http://www.broadbandmap.gov/summarize/nationwide>.

¹¹¹ See Lerner Decl. ¶ 80, citing Nathan Ingraham, *Apple Announces 1 million apps in the App store, more than 1 billion songs played on iTunes radio*, THE VERGE (Oct. 22, 2013, 1:12 PM) <http://www.theverge.com/2013/10/22/4866302/apple-announces-1-million-apps-in-the-app-store>; Josh Ownby, *Google Play Store Hits Million-Apps Milestone*, THE HORN (Aug. 14, 2013), <http://www.gazelle.com/thehorn/2013/08/14/google-play-store-hits-million-apps-milestone>.

¹¹² See *Leading the World* at 2.

order to improve consumers' experience, and are already working on the *next* generation of mobile broadband service. Network investments by Verizon and other mobile broadband providers have made the United States the world leader in wireless innovation, placing it at the epicenter of the app economy and the global device marketplace.¹¹³ Exploding demand for mobile data is likely to continue as Verizon and other mobile providers augment their LTE networks and begin to look at next-generation capabilities such as LTE Advanced.¹¹⁴ Cisco, for example, predicts that mobile data traffic in the United States and Canada will grow *eightfold* between 2013 and 2018 – a rate three times faster than the growth of fixed IP traffic over that same period.¹¹⁵ The growth of the “Internet of Things” is contributing to the rapidly growing demand for mobile data, and will continue to do so, likely spurring additional network enhancements: By 2020, the number of connected devices is expected to grow nearly 30-fold to 26 billion units globally, a figure more than three times the number of smartphones, tablets, and PCs.¹¹⁶

Although wireless broadband services have grown and evolved tremendously, the mobile Internet is still a work in progress that continues to develop and evolve in critical ways.¹¹⁷ For example, mobile broadband services currently compete with fixed services to some extent, and have achieved speeds more than sufficient for many uses of broadband. But, so long as continued innovation is encouraged and permitted, mobile broadband offerings have the potential

¹¹³ American consumers can now choose from among more than 790 handsets and devices that feature over a dozen different operating systems, as offered by multiple facilities-based service providers and resellers and more than 50 different device manufacturers. *Leading the World*, at 15-17.

¹¹⁴ See *Ericsson Mobility Report* at 10-12; *Leading the World* at 15-16.

¹¹⁵ See Cisco Systems, *VNI Mobile Forecast Highlights, 2013 - 2018* (see “Filter by Region”, select “North America”), http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html.

¹¹⁶ See *Gartner Says the Internet of Things Installed Base Will Grow to 26 Billion Units By 2020*, (Dec. 12, 2013), <http://www.gartner.com/newsroom/id/2636073>.

¹¹⁷ See Katz Decl. ¶ 62-63.

to compete with fixed services even more directly over time as providers find new ways to boost speeds and capacity.¹¹⁸ As Professor Katz notes: “[T]he value of investments in innovative network technologies, such as 5G, that promise to deliver dramatically higher speeds to individual users are particularly large. Avoiding inflexible rules that discourage this innovation and investment will increase the degree to which mobile broadband Internet access services provide an effective competitive alternative to fixed-line services.”¹¹⁹

The mobile wireless broadband marketplace is intensely competitive. The wireless broadband market is extraordinarily competitive, offering consumers a great multiplicity of choices.¹²⁰ As the Commission found in the most recent *Mobile Competition Report*, 82 percent of American consumers can choose from at least four wireless broadband providers, while roughly 98 percent can choose from at least two.¹²¹ Wireless broadband providers’ conduct reflects the competitive marketplace: As of December 2013, wireless providers had made over \$398 billion in cumulative capital expenditures to build and upgrade their networks, reflecting 9% year-over-year growth since 1985.¹²² Indeed, wireless providers have invested four times

¹¹⁸ See, e.g., Lerner Decl. ¶ 84 (“As wireless broadband providers continue to improve their networks to increase speeds, and as more wireless spectrum becomes available, wireless networks are likely to become an alternative to wireline providers for a larger range of broadband users and uses.”); *id.* ¶ 86 (“Although the wireless broadband industry is still nascent, and evolving rapidly, these industry developments suggest that wireless networks exert some degree of competitive pressure on wireline broadband providers. With continued, rapid innovation and investment, there is the opportunity for wireless broadband to be a more attractive competitive alternative over time.”).

¹¹⁹ Katz Decl. ¶ 3.

¹²⁰ See *id.* ¶ 62.

¹²¹ *Mobile Competition Report*, at Table 9.

¹²² See CTIA-The Wireless Association, *Annualized Wireless Industry Survey Results - December 1985 to December 2013*, (June 17, 2014), http://www.ctia.org/docs/default-source/Facts-Stats/ctia_survey_ye_2013_graphics-final.pdf?sfvrsn=2 (last visited July 10, 2014). See also Lerner Decl. ¶ 72.

more in their networks per subscriber than the global average.¹²³ Meanwhile, wireless data prices have plummeted.¹²⁴ These developments are the hallmarks of a highly competitive marketplace.

Wireless broadband services face unique technical and operational constraints.

Wireless broadband services face technological and operational constraints arising from the need to manage spectrum sharing by a dynamically varying number of mobile users at any time. As the Commission has recognized, “conditions in mobile broadband networks may necessitate network management practices that would not be necessary in most fixed networks.”¹²⁵ For example, wireless broadband communications require complex and dynamic management of spectrum as the number and mix of users being served by a cell site changes in sometimes highly unpredictable ways. Moreover, these complexities are compounded by the scarce spectrum resources available to each provider, which constrain a provider’s ability to increase network capacity to meet subscriber needs and quality-of-service expectations. Wireless networks face limits imposed by finite spectrum resources. While wireless providers can and do innovate to maximize the traffic that can be transmitted over the available spectrum, they cannot make more of it, and must instead manage their networks to overcome spectrum scarcity.

¹²³ See Didier Scemama, *et al.*, *2014 wireless capex: BRICs & Europe to pick up the slack*, Bank of America Merrill Lynch, Global Telecom Equipment, Jan. 13, 2014, at Table 2. See also Glen Campbell, *2014: The year ahead*, Bank of America Merrill Lynch, Global Wireless Matrix 4Q13, Jan. 8, 2014 at Tables 1 & 2. See also Lerner Decl. ¶¶ 69-72.

¹²⁴ See Maeghan Ouimet, *INFOGRAPHIC: The Staggeringly Huge Future of Mobility*, VISAGEMOBILE MOBILITY BLOG, (Sept. 6, 2012), <http://visagemobile.com/mobilityblog/2012/09/06/infographic-the-staggeringly-huge-future-ofmobility/>.

¹²⁵ *Open Internet Order* ¶ 103.

B. Mobile Wireless Broadband’s Unique Features Warrant a Particularly Light-Touch Regulatory Approach.

Given the dynamic innovation, intense competition, and unique technical constraints that characterize the mobile broadband marketplace, prescriptive regulation would do particular harm to mobile broadband customers. Mobile broadband remains a nascent technology, and will only become a true competitor to fixed service following substantial investment, development, and innovation. “Accordingly, providing flexibility for wireless broadband providers to experiment with and implement different service offerings and business models is particularly important to enhancing the competitiveness of both the wireline and wireless industries.”¹²⁶ However well-intentioned they might be, prescriptive rules would limit the technical flexibility that is so critical to the high-quality mobile services that subscribers demand. Moreover, rigid requirements would stymie rapid innovation in the mobile broadband ecosystem even more than in the context of fixed service, further constraining operators’ efforts to diversify their offerings and address consumers’ evolving preferences. Such rules could even alter the trajectory of mobile wireless’s development, precluding the emergence of even stronger competitors to fixed broadband offerings.¹²⁷ Additionally, in the mobile context, decisions made by the developers of operating systems, devices, applications, as well as app store operators, often dictate whether a particular service or application is available and will work for a particular customer. Applying wireline rules to mobile broadband providers could confuse consumers and create false expectations of

¹²⁶ Lerner Decl. ¶ 15; *see also* Katz Decl. ¶¶ 3; 62-63.

¹²⁷ *See id.* ¶ 3.

compatibility. There is no reason to risk these adverse consequences when the competitive market has protected consumers so well, and will continue to do so.¹²⁸

If the Commission nevertheless opts to apply new requirements for mobile broadband, it should retain the more flexible approach reflected in the 2010 *Open Internet Order* and the *NPRM*. For example, with respect to blocking, the Commission should adopt the *NPRM*'s tentative conclusion to maintain the 2010 framework, which prohibited mobile broadband providers from blocking access to lawful websites or competing voice and video telephony applications.¹²⁹ The *Open Internet Order* appropriately recognized that the download and use of a mobile application presents unique network management issues.¹³⁰ For example, mobile providers may use sophisticated queuing and scheduling algorithms that send more packets to users during times when the “signal-to-noise” ratio is high and fewer packets when that ratio is low.¹³¹ Factors of this type led the Commission to adopt a tailored no-blocking rule for mobile wireless in 2010, and continue to warrant a targeted approach today.¹³²

Likewise, consistent with the *NPRM*'s tentative conclusion, the Commission should decline to apply additional rules, such as the “commercial reasonableness” requirement proposed for fixed providers, to mobile broadband providers.¹³³ These providers can be expected to behave in commercially reasonable ways for the same reasons that companies in hundreds of

¹²⁸ Mobile broadband is also helping fulfill other national goals. As the Commission found in 2010, mobile broadband “is an important Internet access platform that is helping drive adoption.” *Open Internet Order* ¶ 94. Mobile’s role in promoting adoption presents one more rationale for a light touch here.

¹²⁹ *See id.* ¶ 105; *NPRM* ¶¶ 62, 94.

¹³⁰ *See Open Internet Order* ¶ 100 (“We also recognize that accessing a website typically does not present the same network management issues that downloading and running an app on a device may present.”).

¹³¹ *See Comments of Verizon and Verizon Wireless, Framework for Broadband Internet Service*, GN Docket No. 10-127, at Attachment B, Declaration of Jeannie H. Diefenderfer and Thomas K. Sawanobori, ¶ 20 (July 15, 2010) (“Verizon Broadband Services Comments”).

¹³² The Commission should also expressly reaffirm that network operators have the ability to offer parental controls and other usage controls or to place a block on any device for any application that its consumers request.

¹³³ *See NPRM* ¶¶ 62, 140. *See also* Katz Decl. ¶ 62.

other ultra-competitive markets do: because their customers will go elsewhere if they do not, and because existing laws already bar unfair and deceptive business practices. Indeed, the existing transparency rule renders mobile broadband customers even better able to respond to unreasonable practices than consumers in most markets.

The question, then, is not whether mobile broadband providers have strong incentives to behave reasonably – they do – but whether the Commission will subject their practices to a *post-hoc* review process that does not apply even in far less competitive markets. It should reject this latter course, and maintain the current, more flexible approach that continues to be critical to this healthy and dynamic sector. As explained in the 2010 *Open Internet Order*¹³⁴ and above, mobile broadband services continue to evolve rapidly as providers develop innovative offerings to meet consumers’ changing needs. Further restricting the practices of mobile broadband providers would inhibit innovation and experimentation and decrease the number of options available to consumers, causing the mobile market to become homogenized and reducing competition as a result. It would also increase uncertainty in an environment where robust network management practices are essential to meeting customers’ needs. A provider seeking to introduce an innovative new offering – for example, a mobile medical monitoring service or a mobile-optimized content streaming offering – would be forced to weigh the risk that the offering might later be deemed “unreasonable,” notwithstanding its popularity among consumers. Consumers should not be limited by these risks, or confined to a single, government-sanctioned mobile broadband experience. Rather, the Commission should leave mobile users free to choose from among a broad range of different experiences, according to their preferences. Excluding mobile

¹³⁴ See *Open Internet Order* ¶ 94.

broadband from the commercial reasonableness standard will ensure greater choice in the mobile marketplace, maximizing consumer welfare.

IV. BROADBAND RECLASSIFICATION WOULD BE A RADICAL AND RISKY STEP THAT WOULD JEOPARDIZE NATIONAL GOALS AND VIOLATE THE COMMUNICATIONS ACT.

As an alternative to using the Section 706 authority upheld by the D.C. Circuit to regulate broadband Internet access service, the Commission asks whether it should reclassify that service as a “telecommunications service,” in whole or in part.¹³⁵ This approach would be a radical and risky reversal of a successful policy that administrations have uniformly pursued on a bi-partisan basis since the Clinton administration in the 1990s. The prospect of 19th-Century price regulation and Title II’s other arcane requirements would stifle investment in and development of the Internet. Yet Title II would not even address what reclassification supporters say are their concerns—in other words, this unlawful approach is just a Trojan horse to obtain regulation for regulation’s sake. And to the extent that proponents of reclassification *want* Title II to straitjacket innovation, the only beneficiaries of reclassification would be big, established Internet players: any resulting lack of flexibility would forestall the development of differentiated arrangements that might help smaller players be more competitive in the face of the significant advantages established Internet companies have created for themselves.

Reclassification not only would be a radical reversal of approach; it also would be harmful, casting a regulatory pall over virtually the entire Internet ecosystem. The same theory invoked to justify Title II here would apply equally to myriad other services that include or use telecommunications. Reclassification also would have international ramifications that might lead some countries to impose terminating access charges or rate regulations on U.S. broadband

¹³⁵ NPRM ¶ 148.

providers and Internet companies. And as a purely legal matter, if anything, reclassification would face a higher legal hurdle than the Commission's prior rules and, at a minimum, would result in years of investment-detering litigation and uncertainty.

Even if the Commission sought to forbear from certain Title II regulations, that would only exacerbate the complications and uncertainty associated with reclassification, as the Commission and interested parties parsed through which of the ill-fitting provisions to keep and which to toss. Indeed, some of the most restrictive provisions of Title II – including Sections 201, 202 and 214 on which most price and service regulation are founded – are those embraced by the proponents of reclassification as essential to their cause; unless the Commission forbore from these provisions, the bulk of the Title II problems would remain. The Commission should not reverse decades of successful policy to risk what would be the most radical change to Internet regulation since the creation of the Internet.

A. Reclassification Would Be a Radical and Risky Reversal of Successful Policy Uniformly Championed by Commissions for Two Decades.

Imposing a Title II common carriage regime on broadband providers would be a radical change in course that would only chill, not spur innovation. Title II is a regulatory dinosaur, crafted eighty years ago – and based on 19th-Century laws regulating railroads – to address the one-wire world of rotary telephones. All of the hallmarks of Title II – rate regulation, mandatory fees, and the need for advance regulatory permission before offering or discontinuing services – were tailored to address an environment characterized by a government-sponsored monopoly for the provision of pure, relatively simple, and standardized transmission services (*i.e.*, rotary telephone service). That government-granted monopoly and the rudimentary service it proffered would be a radical and risky new approach for today's fast-paced and competitive marketplace for broadband and the wide range of sophisticated services that it encompasses.

Every administration since the Clinton administration has recognized that Title II would be dangerous in the dynamic broadband marketplace. Shortly after the 1996 Telecommunications Act, the Commission stressed, “In no respect are we considering regulating the Internet. Rather. . .we seek to reduce barriers to competition so that companies in all segments of the communications industry have the incentive to innovate.”¹³⁶ In 2002, the Commission formally classified broadband service as an information service, finding that “broadband services should exist in a minimal regulatory environment that promotes investment and innovation in a competitive market.”¹³⁷ And again in its 2005 *Wireline Broadband Order*, the Commission established “a minimal regulatory environment for wireline broadband Internet access services to benefit American consumers and promote innovative and efficient communications.”¹³⁸

For nearly twenty years, the light-touch approach uniformly taken by successive administrations has been successful in ensuring investment, experimentation, and explosive growth in broadband capabilities and services.¹³⁹ For example, that successful regulatory framework has spurred Verizon and others throughout the Internet ecosystem to invest billions of dollars in building out broadband networks and developing the services that ride on them. For

¹³⁶ *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps To Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Report, 14 FCC Rcd 2398, ¶ 18 (1999).

¹³⁷ *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798, ¶ 5 (2002) (“*Cable Broadband Order*”) (internal citation omitted).

¹³⁸ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; et al.*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14,853, ¶ 1 (2005) (“*Wireline Broadband Order*”).

¹³⁹ See, e.g., *id.*, ¶ 44; *Cable Broadband Order*, ¶¶ 44, 52-55; *United Power Line Council’s Petition for Declaratory Ruling Regarding the Classification of Broadband over Power Line Internet Access Service as an Information Service*, Memorandum Opinion and Order, 21 FCC Rcd 13,281 (2006) (“*BPL Classification Order*”); *Petition for Forbearance of the Verizon Telephone Companies Pursuant to 47 U.S.C. § 160(c); et al.*, Memorandum Opinion and Order, 19 FCC Rcd 21,496, ¶ 19 (2004).

example, “[c]able operators responded to the deployment of fiber networks by also offering very high-speed broadband services, including by rolling out DOCSIS 3.0 technology,” and quickly extended their DOCSIS 3.0 deployment to reach about 85 percent of the population.¹⁴⁰

Broadband providers have continued to improve the quality and capabilities of their Internet access services, often integrating more advanced features to improve the security, performance, and functionalities of their services. As a result, these services bear little resemblance to the pure telephone transmission service for which Title II was created. Moreover, broadband providers are now offering a wide range of cloud-based and over-the-top services, both for customers of their Internet access services and increasingly to reach customers over other ISPs’ networks. These sophisticated services all increase consumer choice.

Title II, by contrast, would cripple that freedom, flexibility, and innovation, for its core provisions – such as intrusive price regulation and entry and exit regulation – are classic examples of the kind of arcane regulations that deter investment. Price regulation under Section 201 would empower the Commission, not the market, to determine the value of broadband Internet access. As the Department of Justice warned as recently as 2010, such price regulation would threaten investment in broadband infrastructure and could “stifl[e] the infrastructure investments needed to expand broadband access.”¹⁴¹

Title II’s requirement that providers obtain regulatory permission before introducing or discontinuing services also stands in stark contrast to the “permission-less” innovation that has been the hallmark of the Internet. If applied to Internet services, Section 214 would prohibit broadband providers from adding or extending new services, or discontinuing old services,

¹⁴⁰ Lerner Decl. ¶ 9.

¹⁴¹ Comments of the Department of Justice, *Economic Issues in Broadband Competition; A National Broadband Plan for Our Future*, GN Docket No. 09-51, at 28 (Jan. 4, 2010).

without Commission pre-approval.¹⁴² Yet fast-paced innovation has been essential to market success in the Internet ecosystem. If a provider develops a better way to serve its customers, it races to roll out new features or updates quickly in order to stay ahead of the competition; and if a new service fails to attract customers, a provider must be able to quickly withdraw the service and move on to the next idea. If offering and withdrawing a service were to require FCC approval, the moment for innovation likely would pass long before the Commission could act.

Applying Title II to the American broadband industry would be like tying a cinder block to the ankle of an Olympic sprinter in the midst of a race and then wishing her luck. Reclassification would create a major drag on new and improved broadband infrastructure, even though substantial investment in such infrastructure is precisely what is needed to keep pace with exponentially increasing consumer demands for bandwidth. By chilling such investment and discouraging innovation, Title II and related proposals would only impede, not advance, the public's access to and enjoyment of the Internet. Broadband services and features would ossify, become less robust, and be less able to meet consumers' demands over time. It is no wonder that previous administrations uniformly have avoided that radical path.

Because Title II is such a risky fit for broadband, its requirements would engender legal confusion that could further chill innovation. Many Title II provisions cannot rationally be applied to broadband providers *at all*. Section 223, for example, deals with obligations related to obscene or harassing telephone calls; Section 226 with telephone operator services; Section 227 with restrictions on the use of telephone equipment.¹⁴³ These and other Title II requirements have no bearing whatsoever on Internet services, much less Internet openness. Reclassification

¹⁴² See, e.g., 47 U.S.C. § 214(a) (prohibiting “the construction of a new line or of an extension of any line,” or “transmission over or by means of such additional or extended line, . . . unless and until there shall first have been obtained from the Commission a certificate that the . . . public convenience and necessity require” such action).

¹⁴³ 47 U.S.C. §§ 223, 226, 227.

could therefore generate confusion and legal wrangling as the Commission and industry sorted out how to address such requirements in this context.

Forbearance would not solve these problems. Even if the Commission sought to forbear from certain provisions of Title II, that approach would cause an *additional* legal battle over the scope of such action: which provisions do, or do not, apply, and why that is so. While proponents of Title II suggest that forbearance is the answer to concerns about overly restrictive regulation, the same statutory provisions that they embrace as essential to regulation of the Internet – such as Sections 201, 202, and 214 – are the very provisions on which volumes of price and service regulation are based. Unless the Commission was willing to forbear from these pillars of Title II or to meaningfully limit their scope, the regulatory drag and uncertainty imposed by Title II would persist. Thus, battles over the scope and reach of forbearance would simply pile on to the complexity and uncertainty associated with reclassification, without meaningfully reducing the risk of harmful over-regulation.

In sum, previous administrations were correct in uniformly recognizing that Title II is a risky fit for the dynamic and competitive broadband Internet marketplace. Reclassification would all but guarantee that exciting new Internet access services and powerful new infrastructure become less, rather than more, available to consumers. It would be a radical move that effectively would reverse the success the Internet has seen in the past two decades.

B. Reclassification Would Not Even Achieve the Results Most Desired By Its Proponents – It Would Be Regulation for Regulation’s Sake.

While reclassification would pose considerable risks of disrupting the sustained momentum that has made the Internet more robust and useful to consumers, it would not even achieve the main results desired by its proponents: namely, banning two-sided arrangements or any arrangements that would result in some bits being handled differently than others. By the

terms of the Communications Act, a “telecommunications service” is an offering of “telecommunications *for a fee* directly to the public.”¹⁴⁴ Thus, by reclassifying the service that broadband providers afford edge providers as a separate “telecommunications service,” the Commission would *require* that broadband providers charge edge providers for that service.¹⁴⁵ In fact, two-sided arrangements have existed for decades under Title II, as both customers and long distance providers have contributed to the cost of providing local telephone service. Far from preventing two-sided arrangements, reclassification would mandate them.

Moreover, the history of common carriage is replete with examples of the kinds of differentiated services and pricing that reclassification proponents claim they want to prevent. Title II does not prohibit all differentiation – it merely prohibits unreasonable discrimination in “terms and conditions” for “like” services among “similarly situated” customers.¹⁴⁶ The D.C. Circuit has made clear that two services are not “like” if they are “different in any material functional respect,”¹⁴⁷ and differentiation among “like” services is permissible so long as it is reasonable. Under this standard, the Commission has upheld a wide range of differentiated terms and conditions such as:

Differentiated service levels – Title II authorizes common carriers to offer service level agreements providing different qualities of service and different service level guarantees, for their transmissions.¹⁴⁸ Because the Commission has never prohibited

¹⁴⁴ 47 U.S.C. § 153(46) (emphasis added).

¹⁴⁵ See, e.g., *Qwest Comms. Co. v. Northern Valley Comms. Co.*, Memorandum Opinion and Order, 26 FCC Rcd 8332, ¶¶ 7-10 (2011) (invalidating access service tariff under Section 201(b) where CLEC did not charge end-users for service).

¹⁴⁶ Title II prohibits “unjust or unreasonable discrimination in charges, practices . . . or services,” but expressly permits the creation of “different charges . . . for the different classes of communications” that “the Commission may decide to be just and reasonable.” 47 U.S.C. § 201(b).

¹⁴⁷ *MCI Telecomms. Corp. v. FCC*, 917 F.2d 30, 39 (D.C. Cir. 1990) (internal citation omitted).

¹⁴⁸ See, e.g., *Competitive Telecomms. Ass’n v. FCC*, 998 F.2d 1058, 1064 (D.C. Cir. 1993) (“By its nature, § 202(a) is not concerned with the price differentials between qualitatively different services or service packages. In other words, as far as ‘unreasonable discrimination’ is concerned, an apple does not have to be priced the same as an orange.”).

carriers from offering customers the option of purchasing a *higher* quality of service, that precedent under Title II would permit tiered pricing for “best efforts” and premium delivery services;

Differentiated prices – Title II has long authorized common carriers to offer customer-specific “contract tariffs,” individualized pricing based on in-store customer bargaining, and even “individual case basis” arrangements, such as 8XX service, that shift the payment obligation from one party to another.¹⁴⁹ Thus, Title II could permit analogous arrangements, such as ad-based Internet access or individualized contracts;

Volume and term pricing – Title II permits common carriers to offer volume discounts for customers who purchase services in larger volumes, and term discounts for long-term contracts. These sorts of arrangements likely would enable broadband providers to offer tiered levels of data consumption, as well as discounts for long-term contracts;

Prioritized installation and repair services – Title II authorizes common carriers to prioritize installation and repair. This is yet another example of the ways in which even Title II common carriers can offer differentiated services.

Reclassification therefore would not achieve the results its proponents want, but instead would amount to regulation for regulation’s sake.

C. Any Resulting Lack of Flexibility Would Benefit Established, Not Small Players in the Internet Ecosystem.

To the extent proponents of Title II regulation succeed in constricting the flexibility of broadband providers, reclassification also would disserve proponents’ stated goal of helping the proverbial innovator in her garage to compete against big, established Internet-based companies. Bigger players already have created, in effect, their own fast lanes that smaller players cannot readily replicate, including by constructing or contracting for extensive private networks, server farms, content delivery networks and the like that improve the speed and reliability of their content. To name just a few examples of such methods not realistically available to smaller competitors: Google and other large Internet incumbents have deployed extensive private

¹⁴⁹ See, e.g., *Sea-Land Serv., Inc. v. ICC*, 738 F.2d 1311, 1317 (D.C. Cir. 1984) (permitting carriers to negotiate individual deals with customers at prices below tariff, so long as the same deal is made available to any other customer seeking the same service at the same price).

networks and server farms around the globe to situate their content, such as YouTube videos, closer to end-users and to give themselves significant performance advantages over competitors; Netflix has built its “Open Connect” content delivery network to support its video service, and until recently it denied the highest quality video to end users whose broadband providers did not agree to host Netflix’s servers directly on their networks; and Google directs more traffic to its proxy servers and network in connection with its particular implementation of the SPDY protocol. This is not to suggest that such actions by established Internet players are inherently suspect: to the contrary, many are innovative and may benefit consumers. But to ignore these significant advantages is to ignore the reality of today’s Internet.

Broadband providers’ flexibility to offer differentiated options to other Internet players, alongside the traditional “best efforts” Internet services that will continue to provide an unrestricted path to consumers, could prove crucial to help smaller companies who may seek to compete with the “fast lanes” and other advantages already enjoyed by the likes of Google, Amazon, and Netflix over the rest of the Internet. With flexibility to develop differentiated arrangements, broadband providers would have the ability to work with smaller providers to develop service solutions that potentially could be beneficial and might help them to compete with the established Internet giants in much the way that application stores have helped small software developers compete with established software firms. Flexibility and innovation are therefore essential to help level the playing field for less-established players in the Internet ecosystem.

Ossification under Title II, therefore, would benefit the established Internet players in comparison to smaller start-ups that would compete with them. Title II would eliminate broadband providers’ flexibility to offer truly individualized arrangements and interconnection,

and it would severely slow their ability to develop other technological solutions quickly enough to enable smaller companies to keep pace with the fast lanes of big players.

D. Reclassification Is a Dangerous Approach that Could Sweep in a Broad Range of Internet Services.

Reclassification would be not just risky, but outright harmful, for the stultifying effect of Title II would not necessarily be limited to the operators of broadband networks.

Reclassification could sweep in a broad range of Internet services, such as content, application, and search providers, as well as e-Readers, GPS systems, and other devices. The impact of this potential extension of Title II to additional quarters of the Internet would fundamentally change the Internet as we know it, and not for the better.

The Commission long ago recognized that, if common-carriage regulation applies to Internet access service, “it would be difficult to devise a sustainable rationale under which all, or essentially all, information services did not fall into the telecommunications service category.”¹⁵⁰ Like broadband, “essentially all” Internet-based services involve some combination of data processing and data transmission – that is, both information service and telecommunications service inputs. The Supreme Court has therefore warned that expanding the definition of “telecommunications service” to include broadband would sweep in all Internet-based services that “use telecommunications as an input to provide information service to the public.”¹⁵¹

Thus, if Title II were extended to Internet access services, it is unlikely that such a decision ultimately would be confined to only a narrow sector of the Internet ecosystem. Content, application, and search providers – such as Google and Netflix – use their own network facilities or those of their vendors to speed the transmission of content of a user’s choosing to

¹⁵⁰ *Federal-State Joint Board on Universal Service*, Report to Congress, 13 FCC Rcd 11,501, ¶ 57 (1998) (“*Stevens Report*”).

¹⁵¹ *See NCTA v. Brand X Internet Servs.*, 545 U.S. 967, 994 (2005).

and from that user. Google's use of proxy servers in relation to its use of the SPDY protocol likewise routes traffic over its network and through its routers both to speed up the loading of web pages and especially to drive more traffic onto its routers and capture more customers' information. And e-Readers and GPS devices include transmission capabilities to send and upload content onto the device. There is no principled distinction between these information services and broadband Internet access service.

Indeed, *all* manner of players in the Internet hold out services that include the transmission of data: VoIP providers, online advertising providers, e-commerce providers, and a wide range of other "over-the-top" providers, among others, would be at risk of similarly burdensome regulation. As with broadband providers, these entities have relied on the freedom to experiment with new technologies and business models. Subjecting them to Title II's lumbering approach of central government oversight and pre-approval would handicap the development of Internet-related services – ironically, hampering the creation of new content and applications that Title II proponents seek to promote.

Reversing course in favor of Internet regulation also would have significant international ramifications. It would set a dangerous precedent at a time when the United States has needed to fight vigilantly against international bodies and even repressive regimes that seek greater control over the Internet. In countries where over-regulation of Internet access has already stunted investment in broadband infrastructure, a radical shift in policy here could encourage foreign leaders to extend that regulation to Internet companies of all types. For example, some countries are now targeting large Internet companies, many of which are based in the United States, and are looking to impose government-mandated terminating access charges on data traffic from those U.S. providers. Reclassification would therefore send the wrong signal at the wrong time.

E. Reclassification of Broadband Service, in Whole or in Part, Would Be Unlawful, and the Legal Uncertainty Would Chill Innovation.

In addition to its disastrous results, the Title II approach would also be unlawful. If anything, reclassification would face a much higher legal hurdle than the Commission’s prior rules, and would, at a minimum, result in years of investment-detering litigation.

Reclassification would require revisiting the basic fact that broadband Internet access service *is* an information service, not an offering of the pure transmission of data. Yet now, more than ever, broadband service is a tightly integrated service that cannot realistically be separated into distinct telecommunications and processing components. Reclassification would therefore do serious violence to the basic statutory distinction between “telecommunications service” and “information service,” that underpins the 1996 Telecommunications Act. Furthermore, because the Commission cannot compel common carrier status as either a statutory or constitutional matter, reclassification in whole or in part will engender legal uncertainty that could chill innovation for years to come.

Reclassification Would Face a Heightened Legal Standard. The Communications Act defines “telecommunications service” as an offering of the transmission of data for a fee “*without change in the form or content of the information*” – in other words, a pure transmission service.¹⁵² Any service that changes, stores, or “process[es]” data is, by contrast, an “information service.”¹⁵³ Congress intended, as the Commission has repeatedly found, these categories to be mutually exclusive.¹⁵⁴ Accordingly, a “hybrid” or “mixed” service – which is classified

¹⁵² 47 U.S.C. § 153(43) (defining “telecommunications”) (emphasis added).

¹⁵³ *Id.* § 153(20) (defining “information service” as a service that offers the “capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications”).

¹⁵⁴ *See, e.g., Cable Broadband Order* ¶ 41 (“the Act’s ‘information service’ and ‘telecommunications service’ definitions establish mutually exclusive categories of service”); *Stevens Report*, ¶¶ 13, 39, 43 (describing Congress’ intent and legislative history indicating that definitions are mutually exclusive).

according to consumer perceptions of the finished product¹⁵⁵ – is by “regulatory necessity” an information service whenever its data transmission components are integrated with data processing components.¹⁵⁶ As the Supreme Court held in *Brand X*, broadband service is properly classified as an information service precisely because it transmits data only in connection with further processing, and because that transmission is necessary to providing Internet access service.¹⁵⁷

To change course now and determine, as a factual matter, that broadband service is actually *not* a single integrated offering would require heightened justification under *FCC v. Fox Television Stations, Inc.*¹⁵⁸ In *Fox*, the Supreme Court held that, where a “new policy rests upon factual findings that contradict those which underlay [the agency’s] prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account,” an agency must “provide a more detailed justification” than if it were acting on a blank slate.¹⁵⁹ “It would be arbitrary or capricious to ignore such matters,” the Court explained, because “a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy.”¹⁶⁰ Reclassification would implicate both scenarios by overturning numerous

¹⁵⁵ See, e.g., *BPL Classification Order*, ¶ 38 (finding that whether a service also includes a telecommunications “offering” “turns on the nature of the functions the end user is offered”); *id.* ¶ 35.

¹⁵⁶ Brief for the FCC at 26-27, *NCTA v. Brand X Internet Servs.*, 545 U.S. 967 (2005) (04-277, 04-281), 2005 U.S. S. Ct. Briefs LEXIS, at **45-46 (“FCC *Brand X Br.*”); see *Stevens Report* ¶ 13 (finding such an interpretation necessary to ensure that “information service providers are not subject to regulation as common carriers merely because they provide their services ‘via telecommunications.’”).

¹⁵⁷ See *Brand X*, 545 U.S. at 998.

¹⁵⁸ 556 U.S. 502 (2009).

¹⁵⁹ *Id.*, 556 U.S. at 515 (2009) (majority opinion); see *id.* at 549 (Breyer, J., dissenting) (requiring “a more complete explanation than would prove satisfactory were change itself not at issue” when the agency rested its prior position either on “particular factual findings” or “its view of the governing law”).

¹⁶⁰ *Id.* at 515-16 (majority opinion).

Commission findings that broadband's integrated offering is an information service,¹⁶¹ and by uprooting the reliance interests of players throughout the Internet ecosystem who invested billions in building broadband networks and developed services premised on light-touch regulation.¹⁶²

The Commission cannot satisfy *Fox's* heightened standard because, if anything, broadband providers include *more* integrated and complex functionalities to improve the security, reliability, and performance of their services today than they did in 2005 when *Brand X* was decided. Over the ensuing decade, broadband services have continued to evolve and become increasingly sophisticated, due in large part to the Commission's policy of light-touch regulation, as explained above. Thus, broadband Internet access services continue to integrate information services, including data storage or email services that involve storing or utilizing data; parental controls and other security functions that store security preferences, then filter data as it is retrieved or generated by the consumer; and services for personalizing home portal pages through generating or transforming information.¹⁶³ In addition, broadband providers such as Verizon now integrate into their broadband offerings ever-more advanced features and capabilities, including cloud-based services for storing information, as well as for retrieving and acquiring information via software services;¹⁶⁴ new spam filters and other reputation systems for

¹⁶¹ See *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, Declaratory Ruling, Declaratory Ruling, 22 FCC Rcd 5901, ¶ 1 (2007); *BPL Classification Order*, ¶ 1; *Wireline Broadband Order* ¶ 12; *Cable Broadband Order* ¶ 41.

¹⁶² See *supra* 10-16.

¹⁶³ See Verizon Broadband Services Comments, at Attachment A, Declaration of Michael A. Ritter, ¶¶ 6-8.

¹⁶⁴ See, e.g., *Verizon Introduces Per-Hour Billing for Oracle Database and Oracle Fusion Middleware on Verizon Cloud* (Jan. 10, 2014), <http://newscenter.verizon.com/corporate/news-articles/2014/01-10-per-hour-billing-for-oracle/>.

processing potentially harmful data;¹⁶⁵ and caching servers and CDNs that store media content to enable consumers to access that content at faster speeds. From the perspective of a consumer, then, information service capabilities and data transmission are more intertwined in broadband Internet access service than ever before.

In fact, the services offered today tightly integrate data transmission with data processing – so much so that the two cannot realistically be separated at all. Consider, for example, how an end user even *accesses* a website by clicking on a hyperlink or typing in a domain name. Neither the HTML tag used to encode the hyperlink nor the end user typing in a URL address identify the target website by IP address – in this respect, the end user normally does not even know where it wants to transmit information. Instead, the broadband provider transmits the URL of the target website to its own servers, which house a DNS directory of domain names cross-listed with IP addresses; the provider then searches that directory and generates the appropriate IP address to query. As both the Commission and the Supreme Court have recognized, the transmission of data here *cannot* be separated from the processing that occurs with the DNS service because, without that processing, the provider would not even know where to transmit the information.¹⁶⁶ Such processing occurs every time an end user clicks on a link or types in a domain name.

Now consider what happens when the edge provider tries to send content to the end user. Although the great majority of Internet IP addresses still use the IP address system called IPv4,

¹⁶⁵ See Verizon Broadband Services Comments, at Ritter Decl., ¶¶ 12-17, 24-25; *id.* at Diefenderfer/Sawanobori Decl., ¶ 8.

¹⁶⁶ See *Cable Broadband Order* ¶ 38; *Brand X*, 545 U.S. at 998-1000.

increasingly many at-home consumer devices have addresses on the new IPv6 address system.¹⁶⁷

If an edge provider uses a router programmed for IPv4 addresses, that router will be unable to direct a packet to an end user with an IPv6 address. To correct this problem, broadband providers have begun to maintain servers with dual IPv4 and IPv6 addresses that transform an IPv4 address into an IPv6 address, and vice-versa. Without this necessary processing component, data from an edge provider on the IPv4 Internet could not be transmitted to an end user on the IPv6 Internet.

Countless other features of broadband Internet access service inextricably combine data transmission and data processing. Security features, for instance, operate by having a broadband provider “tag” certain IP addresses as security risks and redirecting a user to a safe filter page whenever the user tries to access those sites. Similarly, parental controls create filters that block certain content on a user’s device by having the broadband provider identify, mark, and ultimately block unwanted content as it travels over the network. And cloud-based services allow remote data storage and access to computing software where the actual computing is done via communication between the end user’s computer and a data center server housed by the broadband provider. In all of these features of broadband service, no data transmission can occur without concomitant data processing: the two are inseparable.

Reclassification Would Violate the Communications Act. Because the telecommunications component of broadband service is inseparable from its data processing component, reclassification would contravene Congress’ express determination that a carrier be

¹⁶⁷ Comcast was the first broadband provider to begin offering IPv6 addresses to at-home consumer devices, in 2011. See Iljitsch van Beijnum, *Comcast begins limited IPv6 rollout to home customers*, ARSTECHNICA (Nov. 10, 2011 4:51 PM), <http://arstechnica.com/business/2011/11/comcast-begins-limited-ipv6-rollout-to-home-customers>. In 2010 less than 1% of all devices connected to the Internet used IPv6 addresses; in 2014 3.5% of devices use IPv6 addresses. See Infographic, *World IPv6 Launch*, THE INTERNET SOCIETY, <http://www.worldipv6launch.org/infographic>.

subject to Title II “*only* to the extent that it is engaged in providing telecommunications services.”¹⁶⁸ The Commission’s proposal to separate out the telecommunications component of broadband service would run roughshod, accordingly, over Congress’ careful statutory definitions of telecommunications service, on the one hand, and information service, on the other. Furthermore, there is no principled distinction between the integrated offering of broadband and other Internet-based information services, especially now that broadband providers have begun to provide some of the same services as edge providers and content delivery networks, as examined above.¹⁶⁹

In an attempt to avoid this inevitable statutory problem, the Commission also requested comment on whether to “separately identify and classify a broadband service that is furnished by broadband providers’ [sic] to edge providers.”¹⁷⁰ But this approach, which has been supported by Mozilla and academic Tim Wu,¹⁷¹ is nothing new. As far back as the original *Cable Broadband* proceeding, various parties urged the Commission to apply *Computer II* rules and require broadband providers to offer a wholesale transmission service separate from the information service aspects of broadband Internet access.¹⁷² But the Commission rejected that approach,¹⁷³ as

¹⁶⁸ 47 U.S. C. § 153(44) (emphasis added).

¹⁶⁹ *Supra* 7-9; *infra* 76-77.

¹⁷⁰ *See NPRM* ¶ 151.

¹⁷¹ *See* Mozilla, *Petition to Recognize Remote Delivery Services in Terminating Access Networks and Classify Such Services as Telecommunications Services under Title II of the Communications Act*, GN Docket Nos. 14-28, 10-127 & 09-191, at 4-5, 9 (May 5, 2014) (“Mozilla Petition”); Letter from Tim Wu and Tejas Narechania, Columbia University to Marlene H. Dortch, Federal Communications Commission, *Open Internet Remand*, GN Docket No. 14-28 (Apr. 14, 2014).

¹⁷² *See Cable Broadband Order* ¶ 42 .

¹⁷³ *See id.* ¶ 43; *see also id.* ¶ 39 (“Cable modem service is not itself and does not include an offering of telecommunications service . . . [Its] telecommunications component is not . . . separable from the data-processing capabilities of the service.”); FCC *Brand X* Br. at 6 (“The Commission rejected arguments that the telecommunications component of an information service should be isolated and viewed separately as an offering of telecommunications.”) (citing *Stevens Report* ¶ 40).

did the Supreme Court when proponents renewed the argument there.¹⁷⁴ And for good reason –as explained below, such an approach would effectively amount to unbundling Internet access service into its component parts, which would complicate service delivery, increase its cost, and discourage consumer use of and provider investment in broadband service.

To the extent proponents now argue that the Commission should hypothesize a separate transmission service offered to edge providers (basically, a virtual wholesale arrangement), the argument is simply repackaging previously rejected arguments and mischaracterizing the services that providers actually offer to the public. Broadband providers offer a single integrated service to consumers that gives them not just access to their choice of content on the Internet, but also security, the ability to back up data, email, cloud-based software services, and web hosting. And to the extent that broadband providers enter into arrangements with differentiated economic terms for specific edge providers, they are still offering the edge providers access to *that same service*.¹⁷⁵

It would blink reality to pretend that broadband providers offer edge providers a different service than the broadband Internet access service that they actually provide and that is the subject of this proceeding. As a result, the Commission could apply Title II in this framework and overcome these metaphysical hurdles only by requiring broadband providers to unbundle their service into its component parts. But that approach would merely resurrect all the problems that have caused the Commission to reject it repeatedly since the Clinton administration: unbundling would create prohibitive complexities in delivering separate services; customers

¹⁷⁴ See *Brand X*, 545 U.S. at 999-1000 (describing how edge provider content sent to consumers is part of the information service provided by broadband Internet access service).

¹⁷⁵ See *Cable Broadband Order* ¶ 38 (“Accordingly, we find that cable modem service, an Internet access service, is an information service. This is so regardless of whether subscribers use all of the functions provided as part of the service, such as e-mail or web-hosting”).

would have to pay for both types of services, which would raise consumer costs; and both problems would drive away consumers and providers from broadband service. As a result, all edge providers would have to offer a variety of information service capabilities currently bundled into broadband service to enable their services.

There is nothing “minimal” about this proposal, nor is it a “compromise,” as Mozilla maintains.¹⁷⁶ Even apart from the above threshold problems, it would be a dangerous course to treat even just a component of broadband service – particularly one as ill-defined as the virtual wholesale arrangement Mozilla describes – as a separate telecommunications service subject to Title II. As with reclassification more generally, such an approach would *require* broadband providers to charge edge providers for every bit transmitted over the network. The statute on its face recognizes that “telecommunications services” are limited to those that are made available to the public “for a fee,” so this approach provides no path to prohibiting paid arrangements between edge providers and broadband providers and instead provides a firm statutory hook for charges. Moreover, even if the Commission could somehow characterize a price of zero for the theoretical edge provider services at issue as a “reasonable” fee – which it could not¹⁷⁷ – how this precedent could be translated in the international context is far from certain. In fact, other countries have already displayed some interest in having termination charges paid by U.S. Internet companies provide a larger portion of funding for those countries’ domestic broadband networks. Add to this the risk that reclassifying one segment of broadband service would open

¹⁷⁶ See Mozilla Petition, at 12.

¹⁷⁷ Any effort by the Commission to set a price of zero for edge provider transmissions would only exacerbate the Takings problems associated with compelled common carrier status, *see infra* at 67-69, and pose other questions about the Commission’s power to set just and reasonable rates under Title II.

the door to classifying “essentially all” Internet-based services as telecommunications services under Title II, and you have a prescription for policy disaster.¹⁷⁸

In short, the Mozilla/Wu approach would lead to the same negative outcomes as broader reclassification, including having serious international ramifications for large, U.S.-based Internet companies,¹⁷⁹ *in addition to* creating all sorts of problems related to unbundling broadband Internet access service.

The FCC Lacks Statutory and Constitutional Authority to Compel Common Carriage.

Reclassification also would be unlawful because the Commission lacks authority to compel common carriage. The Commission asks whether it *should* “apply Title II to broadband Internet access service (or components thereof).”¹⁸⁰ But this is not a decision that the Commission can make at will in order to accomplish the desired policy result *du jour*. As the D.C. Circuit established in *NARUC I*, “[a] particular system is a common carrier by virtue of its functions, rather than because it is declared to be so” by the Commission.¹⁸¹ In other words, common carrier status attaches only if the provider chooses to “undertake[] to carry for all people indifferently,” meaning that it does not “make individualized decisions, in particular cases, whether and on what terms to deal.”¹⁸² That is why common carriage made sense in the case of a monopoly telephone world, but does not make sense for broadband providers.

¹⁷⁸ *Supra* Section IV.D.

¹⁷⁹ *Id.*

¹⁸⁰ *NPRM* ¶ 149.

¹⁸¹ *NARUC I*, 525 F.2d at 644; *see id.* (rejecting “unfettered discretion in the Commission to confer or not confer common carrier status on a given entity, depending upon the regulatory goals it seeks to achieve.”).

¹⁸² *Id.* at 641; *see NARUC v. FCC*, 533 F.2d 601, 608 (D.C. Cir. 1976) (“*NARUC II*”) (“[T]he primary sine qua non” of the analysis is whether the carrier “holds himself to serve indifferently all potential users.”).

Without such voluntary undertaking to carry for the public, compelled common carriage would constitute a government taking.¹⁸³ Historically, such obligations have been permissible only where carriers agreed to hold themselves out as willing to serve all in exchange for a government-granted franchise with limited or no competition.¹⁸⁴ In exchange for that government guarantee, carriers were permitted to charge a rate that would provide an adequate return; this assured return and restrictions on market entry by others allowed carriers to recoup their investment.

None of that, however, applies to broadband. There is no monopoly and no government restriction on entry.¹⁸⁵ The market is competitive, and the government does not guarantee a return. In fact, individualized service determinations have been integral to broadband providers' experimentation with various services and have improved their ability to address consumer demands.¹⁸⁶ Under these circumstances, the Commission's election, as a matter of pure discretion, to apply Title II common carrier regulations to broadband providers would constitute an unlawful government taking. Broadband providers such as Verizon possess vested property rights in the physical infrastructure of the networks they built with billions of private investment dollars. If the Commission were to *force* providers to dedicate those networks to the use of others, that would constitute a government-mandated use of private property for public ends – a

¹⁸³ As *NARUC I* recognized, early common carrier regulations were “challenged as deprivations of property without due process.” *NARUC I*, 525 F.2d at 640.

¹⁸⁴ See *NARUC I*, 525 F.2d at 642 (concept of common carrier “developed as a sort of quid pro quo whereby a carrier was made to bear a special burden of care, in exchange for the privilege of soliciting the public’s business”); *AT&T Submarine Sys., Inc.; Application for a License to Land and Operate a Digital Submarine Cable System Between St. Thomas and St. Croix in the U.S. Virgin Islands*, Memorandum Opinion and Order, 13 FCC Rcd 21,585, ¶¶ 7-9 (1998) (the decision to impose common carriage depends on whether “the public interest . . . require[s] the carrier to be legally compelled to serve the public indifferently” because the carrier “has sufficient market power”).

¹⁸⁵ See *NARUC I*, 525 F.2d at 640; *Verizon Commc’ns Inc. v. FCC*, 535 U.S. 467, 477-89 (2002) (describing how hallmarks of common carriage regulation developed to offset monopoly power in early history of the telephone industry).

¹⁸⁶ See *supra* at 18-19.

per se taking.¹⁸⁷ Even if the Commission purported to provide compensation for that taking, that would not solve the basic problem of the lack of any clear mandate from Congress to engage in the taking in the first place.¹⁸⁸ In any event, compelled common carrier status would constitute a regulatory taking because such action would “interfere[] with [broadband providers’] distinct investment-backed expectations,” *Penn Cent. Trans. Co. v. City of New York*, 438 U.S. 104, 124 (1978), to manage access to their networks and use them to provide the services customers want. Compelled common carriage also would violate the First Amendment rights of broadband Internet access providers, who use their platform to “engage in and transmit speech”¹⁸⁹ – namely, their own Internet services and others’ content services. Broadband networks are the modern-day equivalent of the printing press. Those networks, no less than printing presses or newspaper stands, cannot be conscripted for speech on the government’s terms.¹⁹⁰ Nor can the government discriminate against speakers by singling out broadband service providers (and their prospective content partners) from Internet backbone services, content delivery networks, and other services

¹⁸⁷ See *Loretto v. Teleprompter Manhattan CATV*, 458 U.S. 419 (1982); D. Lyons, *Virtual Takings: The Coming Fifth Amendment Challenge to Net Neutrality Regulation*, 86 Notre Dame L. Rev. 65, 93 (2011) (explaining that in a common carriage regime edge providers would “receive an unlimited, continuous right of access to broadband providers’ private property,” which “allows them to physically invade broadband networks with their electronic signals and permanently occupy portions of network capacity”).

¹⁸⁸ See *Bell Atlantic Tel. Cos. v. FCC*, 24 F.3d 1441, 1444-46 (D.C. Cir. 1994); see also *Ramirez de Arellano v. Weinberger*, 745 F.2d 1500, 1510 (D.C. Cir. 1984) (en banc) (“When there is no authorization by an act of Congress or the Constitution for the Executive to take private property, an effective taking by the Executive is unlawful because it usurps Congress’s constitutionally granted powers of lawmaking and appropriation.”), *overturned on other grounds*, 471 U.S. 1113 (1985).

¹⁸⁹ *Turner Broad. Sys., Inc. v. FCC*, 512 U.S. 622, 636 (1994) (describing similar First Amendment rights of cable programmers and cable operators).

¹⁹⁰ See, e.g., *Citizens United v. FEC*, 558 U.S. 310, 441 (2010) (noting that the First Amendment “reject[s] the premise that the Government has an interest in equalizing the relative ability of individuals and groups to have their voices heard”) (internal citation omitted); *Miami Herald Publ’g Co. v. Tornillo*, 418 U.S. 241, 257 (1974) (“Government-enforced right of access inescapably dampens the vigor and limits the variety of public debate.”) (internal quotation omitted).

that have a similar ability to exercise editorial control over the delivery of content.¹⁹¹ These constitutional concerns are further reason not to pursue reclassification.

Nor could the Commission avoid the above legal hurdles by adopting Congressman Waxman's suggestion and "proceed[ing] under Section 706 but us[ing] Title II as a 'backstop authority.'"¹⁹² The Commission cannot use Title II as a "backstop," for that would require the very definition of arbitrary and capricious decision-making. Effectively, that proposal would have the Commission issue two orders: one finding that broadband service is an information service; the other simultaneously finding just the opposite, namely, that broadband service is a telecommunications service. Certainly *Fox* permits an agency to change its mind later, but the agency cannot simultaneously reach mutually exclusive outcomes on the same issue. Moreover, backstop authority only creates more regulatory uncertainty. In order to use Title II in this fashion, the Commission would need to exercise forbearance with its Title II provisions. As explained above, that approach, however, would cause a long and investment-detering legal battle over the scope of the Commission's forbearance.¹⁹³

Congressman Waxman's second proposal – that the Commission reclassify broadband but exercise forbearance so long as the Section 706 rules remain in effect – fares no better. In addition to suffering from all the problems that plague his first proposal, it fundamentally misses that the Commission cannot impose common carriage requirements *at all* until broadband providers choose to hold themselves out to the public indiscriminately. The second approach, therefore, adds nothing except regulatory rigmarole and additional uncertainty related to the scope and operation of any proposed forbearance.

¹⁹¹ See *Citizens United*, 558 U.S. at 353 ("differential treatment cannot be squared with the First Amendment").

¹⁹² *NPRM* ¶ 150 (describing letter from Representative Henry Waxman).

¹⁹³ See *supra* Section IV.A.

As the Commission recognized long ago, all of these substantial legal hurdles would engender regulatory uncertainty that would “discourage investment in facilities” and spur broadband providers to “raise their prices and postpone or forego plans to deploy new broadband infrastructure.”¹⁹⁴ In this regard, exercising forbearance would not help, as legal uncertainty about the extent of that forbearance and its permanence could still “chill innovation.”¹⁹⁵

At this juncture in the history of the development of broadband Internet service, reclassification, either in whole or piece parts designed to accomplish the same regulatory ends, would be a radical and risky reversal of a successful policy that has fostered innovation, growth, and better satisfaction of consumer needs. It would fail to accomplish what its proponents want, all the while endangering the entire Internet ecosystem and benefiting only established Internet-players. And because reclassification would violate both the Telecommunications Act of 1996 and the Constitution, it would only create further legal uncertainty that would chill innovation and investment. Reclassification under Title II ultimately would deprive consumers of the benefits of not just today’s *foreseeable* innovations but tomorrow’s as-yet *unimagined* innovations. Stuffing broadband into a Title II box would create not an open Internet but one flash-frozen in 2014. This profoundly counter-productive policy is not the path forward.

V. THE COMMISSION SHOULD REFRAIN FROM IMPOSING ANY RULES ON INTERNET INTERCONNECTION ARRANGEMENTS, SPECIALIZED SERVICES, OR ENTERPRISE OFFERINGS.

Finally, if the Commission does adopt new open Internet rules, it should not extend them beyond the scope of the earlier rules and should maintain a focus on mass market Internet access

¹⁹⁴ FCC *Brand X* Br. at 31; see *Stevens Report* ¶ 47 (“Such a presumption [in favor of Title II regulation of broadband providers] would be inconsistent with the deregulatory and procompetitive goals of the 1996 Act.”).

¹⁹⁵ *Id.* ¶ 47.

services offered over fixed broadband networks. The Commission should not impose any new rules on Internet interconnection arrangements, specialized services, or enterprise offerings. Rules designed for the specific context of last-mile Internet access would not be appropriate in any of these areas.

A. There Is No Reason to Apply Open Internet Rules to Peering, Transit, and Other Internet Interconnection Arrangements.

Given the unique circumstances presented by Internet interconnection – including an intensely competitive marketplace and a long history of successful market-based interactions – there is no basis to subject peering, transit, or other forms of Internet interconnection to rules designed for the specific context of last-mile Internet access. Rather, the Commission should adopt its tentative conclusion to exclude such arrangements from any new rules it may adopt.¹⁹⁶ As Chairman Wheeler repeatedly has recognized, Internet interconnection issues are distinct from the last-mile access issues involved in the “open Internet” debate.¹⁹⁷

Internet traffic can reach an ISP in many ways. Throughout the Internet’s history, content providers and their service providers have relied on commercially negotiated agreements with backbone operators – network providers with extensive facilities used to carry Internet traffic around the globe. These backbone providers themselves make arrangements with other

¹⁹⁶ NPRM ¶ 59.

¹⁹⁷ See, e.g., Statement of Chairman Tom Wheeler, Press Conference, June 13, 2014 (stating that net neutrality issues and peering issues may be “cousins, but they’re not the same thing”); FCC Chairman Tom Wheeler: “A lot of people seem to think the whole peering and interconnection topic is the same as net neutrality. It’s not, it’s a different issue — it’s a cousin, maybe a sibling, but it is not the same issue.” Stacey Higginbotham, *The Netflix-Comcast agreement isn’t a network neutrality violation...* GIGAOM (Feb. 23, 2014 5:37 PM), <http://gigaom.com/2014/02/23/the-netflix-comcast-agreement-isnt-a-network-neutrality-violation-but-it-is-a-problem/> (quoting Jan. 28, 2014 CSPAN interview with Chairman Wheeler); Oversight of the Federal Communications: Hearing Before the Comm’ns and Technology Subcomm. of the H. Comm. of Energy and Commerce, 113th Cong. (May 20, 2014) (see Bryce Baschuk, FCC Chairman Defends Net Neutrality Proposal to Skeptical Lawmakers, Bloomberg BNA (May 22, 2014), <http://www.bna.com/fcc-chairman-defends-n17179890700/> (Chairman Wheeler states “peering... is ’a separate issue”); Matthew Schwartz, *Wheeler Promises FCC Will Be ‘Nimble’ as Technology Evolves*, COMMUNICATIONS DAILY, Feb. 11, 2014 (quoting Chairman Wheeler statement that backbone interconnection “has been lumped into the ‘open Internet’ kind of issues, but I don’t think it really is [part of that set of issues]”).

backbone providers, and traffic carried between Internet endpoints often transits multiple backbone networks. The commercial agreements between networks might create “peering” relationships, in which networks interconnect directly and exchange traffic, or “transit” relationships, in which one provider agrees to ensure that another provider’s traffic will reach its destination, even if it must travel over the networks of additional *other* providers. Transit agreements have always involved payment. Peering agreements may or may not involve payment through the exchange of money: In some cases, the networks agree that it is simpler to “call it even” and exchange traffic on a settlement-free basis without incurring the cost of measuring it and making payments. In other cases – especially when the traffic exchanged between networks is not roughly in balance – the provider receiving more traffic than it sends will charge the other provider to peer with it, thus helping to compensate for the receiving provider’s greater relative costs to handle the other network’s traffic.

Over time, players in the Internet ecosystem have created new and innovative interconnection arrangements in response to changes in end users’ demands. Content delivery networks developed to hasten traffic delivery, and now use geographically dispersed servers to store (“cache”) content nearer to end users. CDNs, which allow traffic to reach end users more quickly and with less latency or jitter than traffic travelling over a series of backbone networks, have developed into a principal means for delivering video and other high-bandwidth content. Companies such as Akamai, Limelight and Verizon’s EdgeCast sell CDN services to third-party content providers, and numerous entities – most notably Google and Netflix – have constructed their own CDNs. CDNs, in turn, often rely on transit providers to deliver their cached content to ISPs.¹⁹⁸

¹⁹⁸ See Lerner Decl. ¶¶ 57-60.

As new business models have arisen, the Internet itself has shifted from a hierarchical network featuring large Internet backbones interconnecting with smaller backbones and (ultimately) the ISPs serving content providers and end users into a much more complex network in which providers interconnect in a multitude of ways. In addition to relying on CDNs to aggregate traffic and deliver them to ISPs (as Netflix used to do for all of its traffic), a content provider can choose from among at least a dozen major providers of “transit” services whose business models revolve around the delivery of traffic to ISPs, or can interconnect directly with the ISP itself. Verizon’s network is one of the most interconnected in the world. Verizon has hundreds of agreements involving the exchange of U.S. Internet traffic with Verizon’s last-mile and backbone networks. These include, but are not limited to, arrangements such as Internet access, transit, peering, colocation, hosting, and content distribution. The parties on the other side of these agreements include Internet backbone providers, transit providers, ISPs, CDNs, and edge providers. While Verizon’s recent interconnection deal with Netflix has drawn public attention, other content providers that make up a significant percentage of overall traffic have for years entered into similar arrangements to directly interconnect with our network. They have generally found that such agreements are a successful and cost-effective way to provide high-quality service to their own customers without the need to rely on Internet middlemen. The breadth and variety of these agreements reflect that there are many ways to reach Verizon’s customers and that Verizon is a cooperative, good-faith player in the interconnection market.

The need for flexibility – and the complexity of this sector – has increased over time as many companies are assuming multiple roles in the Internet ecosystem. Verizon, for example, is not only an ISP but also a backbone network providing both peering and transit service. Last year, Verizon purchased EdgeCast, which operates a CDN that interconnects with other last-mile

ISPs around the globe. Likewise, Google, Netflix and many other large content providers now control significant networks of their own, and often operate their own CDNs. The marketplace has prompted other providers to adopt a similar range of roles to best meet customer needs.¹⁹⁹

This diversity of roles and interconnection options has become critical to the Internet's functioning – without them, the Internet might still be optimized for text-based news sites and blogs rather than for streaming massive volumes of HD content. Moreover, even amidst burgeoning complexity, this system has functioned smoothly, and traffic has reached its destination. But the robust ecosystem we enjoy today would not exist if the Commission had adopted a regulatory approach to Internet interconnection rather than the market-driven approach it chose. Providers and regulators alike would have been hard-pressed to predict the swift rise of online video and other high-volume traffic, and rules premised on a pure peering/transit framework could have brought the Internet to its knees as traffic patterns shifted and volumes exploded. Fortunately, the Commission relied instead on a flexible commercial approach, which permitted a diversity of interconnection arrangements and the rise of CDNs, and allowed backbone providers to meet consumer demand by deploying new facilities where necessary. These investments have, in turn, promoted competition, and prices for transit continue to fall – creating a *de facto* limit on paid peering rates.²⁰⁰

¹⁹⁹ For a general discussion of Internet architecture, *see, e.g.*, Jonathan E. Nuechterlein and Philip J. Weiser, DIGITAL CROSSROADS: TELECOMMUNICATIONS LAW AND POLICY IN THE INTERNET AGE 178-85 (2d ed. 2013). For a discussion of the peering and transiting regime as it existed in 2000, *see* Michael Kende, Office of Plans and Policy Working Paper, *The Digital Handshake: Connecting Internet Backbones*, Federal Communications Commission, (Sept. 2000), http://transition.fcc.gov/Bureaus/OPP/working_papers/oppwp32.pdf.

²⁰⁰ In connection with a hearing before Congress, the founder and CEO of Cogent, a leading transit provider, submitted written testimony stating that Cogent had reduced its prices by 22 percent per year over the past five years. *See* Written Statement of Dave Schaeffer, Chairman and CE O, Cogent Communications Group, Inc., Hearing Before the Regulatory Reform, Commercial and Antitrust Law Subcomm. Of the H. Comm. of the Judiciary, at 3 (May 8, 2014), <http://judiciary.house.gov/cache/files/d89e8174-d014-4ade-8a00-58c5b9350dd4/schaeffer-testimony.pdf>.

So, too, it will be difficult – if not impossible – to predict what new arrangements will arise to serve consumers’ and edge providers’ needs *going forward*, as usage patterns, content offerings, and capacity levels continue to evolve. Under these circumstances, regulations cabinining the scope of permissible interconnection arrangements would undercut consumer interests, distorting or impeding the Internet’s ability to serve consumers’ ever-changing needs.

Notwithstanding the long track record of success from the market-based approach to Internet interconnection, Netflix and some of its transit providers continue to point the finger at ISPs such as Verizon in an effort to expand the reach of net neutrality regulation beyond the last mile and to obtain zero-cost, regulated access to ISPs’ networks. Netflix’s “strong net neutrality” proposal is in fact a thinly disguised effort to jettison the long-standing, market-based approach to Internet interconnection in favor of a regime in which content providers and their transit carriers are entitled to free interconnection with an ISPs’ networks regardless of the costs they impose or whether they have any obligation at all to carry traffic from that ISP in return. This proposal would completely supplant the market-based approach that has encouraged infrastructure investment and allowed the Internet to flourish even as usage has soared and demands on networks have evolved. Netflix’s invocation of the “net neutrality” rubric is clever, but inapt: Netflix merely seeks to avoid the costs that it and other content providers have always incurred to deliver content and to place those costs – for the first time ever – on the ISP alone.

In pursuit of this agenda, Netflix has suggested that Verizon and other ISPs are causing widespread congestion to the harm of consumers, but, as independent analysts have confirmed, this is not so. Researchers at MIT led by David Clark recently issued a preliminary report finding that there was not a “widespread congestion problem among the U.S. providers.”²⁰¹ In

²⁰¹ MIT Information Policy Project, *Measuring Internet congestion: A preliminary report*, at 2 (2014), <https://ipp.mit.edu/sites/default/files/documents/Congestion-handout-final.pdf>.

fact, the report noted that most of the observed congestion related to Netflix traffic, and that “it would appear that all parties are moving toward adequate resolution.”²⁰² The MIT report also noted that congestion on the Internet often resulted from “decisions by content providers [such as Netflix] as to how to route content,” which can result in sudden congestion problems. Verizon’s recent investigation into the cause of slow Netflix streaming experienced by one of its FiOS customers confirmed the MIT report’s view.²⁰³ We found that the congested Netflix traffic was caused by Netflix’s decision to route its traffic over a handful of transit providers who had not made arrangements for connections that could handle Netflix’s traffic volumes, while the other peering and transit providers and content providers interconnecting with Verizon’s network in the customer’s area were not experiencing congestion. Thus, the solution to Netflix’s congestion problems is for Netflix to negotiate for direct interconnection paths capable of handling its unprecedented traffic volumes (as it has recently done with Comcast and Verizon) or to use other network providers or CDN providers that have done so. There is simply no reason to reverse the long-standing commercial approach to Internet interconnection, which has worked well and evolved effectively over time with minimal bumps in the road for consumers. Indeed, the commercial approach has worked here as well: As the recently negotiated arrangement between Netflix and Verizon is implemented, the congestion problems caused by Netflix’s previous decisions about how to route its flood of traffic should resolve. Notably, this pro-consumer result transpired without regulatory involvement. The Commission should continue with its approach to this area of the marketplace by encouraging the negotiation of such mutually

²⁰² *Id.*

²⁰³ See David Young, *Why is Netflix Buffering? Dispelling the Congestion Myth*, VERIZON POLICY BLOG, <http://publicpolicy.verizon.com/blog/entry/why-is-netflix-buffering-dispelling-the-congestion-myth> (last visited July 14, 2014).

beneficial arrangements for interconnection, and should continue to exclude such arrangements from the scope of any open Internet rules.

B. There Is No Reason to Apply Open Internet Rules to Specialized Services.

In order to allow space for innovation, the Commission likewise should maintain its approach of not applying open Internet rules to specialized services.²⁰⁴ As the Commission previously recognized, specialized services “differ from broadband Internet access service and may drive additional private investment in broadband networks and provide end users valued services, supplementing the benefits of the open Internet.”²⁰⁵ Specialized services are by definition distinct from the customer’s broadband Internet access service – they merely supplement such service, increasing the range of options available to the consumer and expanding consumer welfare. Based on this understanding of the pro-investment and pro-consumer potential of specialized services, the Commission decided in 2010 to exempt specialized services from the scope of its open Internet rules.²⁰⁶ It should reaffirm that choice here.

As technology advances and turns concepts such as remote surgery, distance-learning, and the Internet of Things into realities, the ability to offer specialized services could be critical to promoting consumer interests and national policy priorities. Likewise, the promise of specialized services will promote even greater investment in broadband infrastructure – investment that benefits all users, whether or not they partake in such offerings themselves. There is, moreover, no evidence suggesting that specialized services have “undermin[ed] or threat[ened]” the open Internet, or that they will. Nor is there any reason to believe that

²⁰⁴ *NPRM* ¶ 59.

²⁰⁵ *Open Internet Order* ¶ 112.

²⁰⁶ *See id.* ¶ 113.

specialized services are limiting the growth or capacity available for broadband Internet access service.²⁰⁷ Thus, there is no basis for the Commission to depart from its restrained approach.

The Commission also should refrain from further *defining* specialized services while they are still in their infancy.²⁰⁸ The *Open Internet Order*'s definition – “other services [provisioned] over the same last-mile connections used to provide broadband service”²⁰⁹ – is appropriately broad, given that specialized services have yet to mature into a well-defined class of offerings. During these early stages of their development, the Commission should allow specialized services to evolve into a commonly understood category. In doing so, the Commission will allow innovation to flourish, enabling industry players to develop new types of specialized services that will “drive additional private investment in broadband networks and provide end users valued services. . . .”²¹⁰

C. There Is No Reason to Apply Open Internet Rules to Enterprise Services.

The Commission should continue to exclude enterprise services from its open Internet rules.²¹¹ In 2010, the Commission observed that enterprise services, such as virtual private network services, hosting, and data storage services, “typically are not mass market services and/or do not provide the capability to transmit data to and receive data from all or substantially all Internet endpoints.”²¹² As the *NPRM* recognizes, enterprise services “are typically offered to

²⁰⁷ See *id.* ¶ 114. In any event, providers must disclose whether specialized services affect available capacity of broadband Internet access service in order to provide “effective disclosure” under the current transparency rule. See *id.* ¶ 56.

²⁰⁸ *NPRM* ¶ 60.

²⁰⁹ *Open Internet Order* ¶ 7.

²¹⁰ *Id.* ¶ 112.

²¹¹ See *NPRM* ¶ 58.

²¹² *Open Internet Order* ¶ 47.

larger organizations through customized or individually negotiated agreements.”²¹³ Moreover, the Commission has historically treated enterprise and mass-market broadband offerings differently. There is no reason for the Commission to collapse this long-standing distinction here. Indeed, imposing new terms that enterprise customers might not desire and have not bargained for could render certain enterprise offerings uneconomic (e.g., by reducing investment incentives and altering bargaining power) and undesirable (e.g., by disabling priority features specifically sought by private IP enterprise customers). The Commission should refrain from disturbing this highly competitive marketplace.

VI. CONCLUSION

The consistent, light-touch approach to Internet regulation over the last two decades has yielded enormous consumer benefits, and the Commission should maintain that course. Even as the Commission considers how best to protect consumers and prevent harm to competition, it should pursue a balanced approach that relies most heavily on informed consumer choices and that allows flexibility to meet consumers’ evolving demands. The Commission should reject the ultra-regulatory path of Title II “reclassification,” which would be a radical reversal that would harm consumers and the continued development of the Internet, and would result in a protracted period of investment-sapping uncertainty.

²¹³ *NPRM* ¶ 58 (citing *Open Internet Order* ¶ 45).

Respectfully submitted,

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July 15, 2014

EXHIBIT 1

Protecting and Promoting Consumer Benefits Derived from the Internet

**Declaration of Michael L. Katz
July 15, 2015**

**PROTECTING AND PROMOTING CONSUMER BENEFITS
DERIVED FROM THE INTERNET**

Declaration of Michael L. Katz

July 15, 2014

CONTENTS

I.	INTRODUCTION AND OVERVIEW.....	1
II.	THE COMMISSION’S FUNDAMENTAL APPROACH TO REGULATING INTERNET ACCESS PROVIDERS SHOULD BE TO PROMOTE AND PROTECT UNDISTORTED COMPETITION.....	8
A.	FLEXIBILITY HAS BEEN KEY TO THE INTERNET’S SUCCESS IN GENERATING CONSUMER BENEFITS.	8
B.	PRIVATE INVESTMENT AND INNOVATION IN BROADBAND ACCESS NETWORKS ARE VITAL TO CONSUMER WELFARE.	12
III.	TRANSPARENCY REQUIREMENTS.....	14
IV.	THE NO-BLOCKING RULE.....	19
V.	COMMERCIALLY REASONABLE PRACTICES.....	23
A.	POTENTIAL GUIDING FACTORS.....	24
B.	LIMITATIONS ON DIFFERENTIATED ARRANGEMENTS BETWEEN LAST-MILE ACCESS PROVIDERS AND EDGE PROVIDERS WOULD VERY LIKELY HARM COMPETITION AND CONSUMERS.....	26
C.	SAFE HARBORS AND PRESUMPTIONS OF REASONABLENESS.....	31
1.	<i>Non-Exclusive, Non-Affiliated Agreements.....</i>	<i>31</i>
2.	<i>Sufficient Competition and Practices Already Used by Other Broadband Internet Access Providers.....</i>	<i>32</i>
3.	<i>Two-Sided Pricing.....</i>	<i>33</i>
VI.	IMPOSING NEW RULES ON MOBILE WIRELESS BROADBAND INTERNET ACCESS PROVIDERS WOULD RISK DISTORTING COMPETITION AND HARMING CONSUMERS.....	37
VII.	CONCLUSION.....	40
VIII.	APPENDIX: QUALIFICATIONS.....	42

I. INTRODUCTION AND OVERVIEW

1. The Federal Communications Commission (Commission) has opened a proceeding in which the Commission seeks comment on “[w]hat is the right public policy to ensure that the Internet remains open?”¹ The Commission also seeks comments on several proposed rules.

2. At the request of counsel for Verizon, I have conducted an economic analysis of the likely effects of the Commission’s proposed rules on the consumer benefits derived from the Internet. I analyze the proposed rules’ effects on consumer welfare because the maximization of consumer welfare is the most fundamental public policy objective with respect to the Internet. That analysis reveals that, if implemented incorrectly, the Commission’s proposed rules would very likely harm competition, innovation, and investment, and, consequently, would harm consumer welfare. However, if implemented in a flexible manner with appropriate safe harbors and presumptions of reasonableness, the proposed rules could protect consumer welfare.

3. Briefly, my specific findings are the following:

- *Flexibility has been critical to the Internet’s success, and rules should preserve that flexibility.* The Internet ecosystem has been very flexible, to the great benefit of consumers. As many have noted, that flexibility has allowed a wide range of new applications and services to develop that make use of the Internet infrastructure, including email, e-commerce, social networking, photo sharing, video conferencing,

¹ Federal Communications Commission, Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (rel. May 15, 2014) (hereinafter, *NPRM*), ¶ 2.

and content streaming, to name just a few. Consumers have also benefited from other forms of flexibility, including the flexibility with respect to business models and business relationships. Prominent examples of new business models include content delivery networks and a wide variety of advertiser-supported content services, such as web search and video download services.

- *The Commission's fundamental approach to promoting consumer benefits from the Internet should be to promote and protect undistorted competition.* No one knows what will be the optimal forms of economic relationships between different participants in the Internet ecosystem in the coming years. Rather than imposing a particular structure and vision on market participants, the Commission should adopt policies that promote undistorted competition. Doing so would best serve consumer interests because it would allow those interests (as expressed through market forces) to drive the services and applications that are commercially successful and, thus, are offered to consumers. A policy approach of promoting undistorted competition would allow the full expression of consumer desires and would allow Internet access and edge providers to experiment with and implement a wide range of approaches as they seek to discover which business models most successfully serve consumer interests.
- *Rules that restrict flexibility or take a one-size-fits-all approach risk distorting competition and harming innovation, investment, and consumer welfare.* To the extent that the Commission's rules lead to better-informed consumers and allow firms to respond flexibly in innovative ways to consumers' demands, these rules can promote competition and consumer welfare. However, to the extent that the

Commission's rules constitute de jure or de facto prohibitions of certain business models, pricing strategies, or the full use of network management techniques, these rules risk distorting competition and harming consumers. Consumer welfare is best protected if the Commission allows broadband Internet access providers to manage their networks and offer differentiated services or implement innovative pricing strategies as long as those practices do not harm competition. Moreover, where conduct is disallowed, public policy should do so only in response to specific instances of identified harm, rather than imposing sweeping prohibitions that throw out the good with the bad.

- *Transparency regarding service offerings and network management practices can promote competition and consumer welfare by allowing consumers to make better-informed choices, but ill-formed or arbitrarily applied rules can have adverse unintended consequences and impose unnecessary costs.* The Commission's transparency policy should: (a) generate information that aids decision making by *real-world* consumers; (b) be flexible without creating excessive uncertainty; (c) recognize the possibility of adverse unintended consequences; and (d) account for the presence of existing consumer protection laws and policies. The Commission should also recognize the roles of firms other than last-mile access providers in shaping end users' experiences. For example, congestion can be caused by the decisions of content providers, transit providers, and content delivery networks concerning traffic routing, network interconnection, and server capacity, among other things. The Commission's

transparency rule should not require access providers to be “transparent” about information or practices outside of their control.

- *In order to promote consumer welfare, the focus of any no-blocking rule should be on anticompetitive blocking.* Presumably, consumers would like access to whatever edge providers they choose, and market forces generally have driven and will continue to drive Internet access providers to offer services that do not block access to any lawful edge provider’s service. Moreover, several access providers, including Verizon, have publicly committed not to block or degrade lawful content regardless of its source. If the Commission implements a no-blocking rule, it should specifically focus on blocking that demonstrably harms competition. The no-blocking rule should also reflect the facts that: (a) an overly broad interpretation of “blocking” can distort or stifle competition and harm consumers by interfering with legitimate network management functions or service features that give consumers greater options for their Internet experience, and (b) the presence of a vigorous antitrust enforcement regime attenuates the benefits of the Commission’s imposing a no-blocking rule.
- *Unless clear and meaningful safe harbors or presumptions are identified, a rule prohibiting “commercially unreasonable” practices could distort and discourage network management, innovative pricing, and other business practices that would otherwise benefit consumers.* Network management can facilitate more efficient use of capacity and can protect consumers from harmful traffic and applications (e.g., spam or viruses that create zombie computers). However, unless properly formulated and applied, the proposed rule would create an uncertain regulatory environment that

could discourage efficient network management. Similarly, unless properly formulated and applied, the proposed rule could block or slow the emergence of new pricing and service models that could otherwise benefit consumers by facilitating the entry of new edge providers and/or promoting efficient, pro-consumer behavior by incumbent edge providers.

— *A per se prohibition of differentiated arrangements would limit flexibility and innovation and, thus, very likely harm consumers without offering any offsetting benefit.* Arguments that differentiated arrangements harm competition and consumers because some edge providers might gain competitive advantage over others are based on a misunderstanding of the competitive process and how it benefits consumers. Allowing an edge provider to make expenditures to improve its service through a differentiated arrangement is a pro-competitive action that benefits end users directly (by offering them a more-attractive service option) and indirectly (by increasing the competitive pressures faced by rival edge providers). Moreover, a differentiated access arrangement might be an important component of a new entrant's strategy for challenging well-established incumbents that already purchased superior Internet access by building their own backbone networks or making extensive use of content delivery networks (CDNs). Flexibility to experiment with differentiated arrangements that are of interest to edge providers and end users is thus a critical component of any regulatory regime, and a ban on such arrangements could give rise to substantial harms in the future as the Internet ecosystem continues to evolve. Moreover, a per se prohibition

would offer little or no incremental benefit over existing state and federal antitrust policies of general applicability that already provide fundamental protections should there be particular instances of differentiated arrangements that harm competition.

— *Two-sided pricing should be presumptively reasonable.* Two-sided pricing models (e.g., an edge provider’s helping to cover end users’ Internet access costs) can be an innovative and valuable component of Internet access and edge providers’ competitive strategies that benefits consumers. The Commission should not intentionally or unintentionally create barriers to such pricing by leaving it under a cloud of regulatory uncertainty. Instead, the Commission should declare two-sided pricing to be presumptively reasonable. The fundamental rationale for a presumption of reasonableness is that an edge provider’s decision to pay all or part of end users’ costs of gaining access to its services improves the value of its services and does not degrade or reduce the value of the services offered by rival edge providers.² In other words, it is competition on the merits.

- *Imposing new rules on mobile wireless broadband Internet access providers risks distorting competition and harming consumers.* Application of additional rules to wireless broadband Internet access providers poses substantial risks of distorting competition and harming consumers. This is so for at least three broad reasons. First,

² For example, if the Commission implements a rule prohibiting broadband Internet access providers from blocking edge providers from a baseline level of end-user access, that option would remain open to an edge provider regardless of whether a rival edge provider chose to pay all or part of end users’ costs of gaining access to its services.

the wireless industry very successfully offers a variety of mobile Internet access services. Given the strength of competition, there is relatively little reason to believe that pervasive regulatory intervention will improve market performance. Instead, applying new rules to the wireless industry may distort competition to consumers' detriment. Second, although network management and revenue-model innovation are important to the successful operation of any communications network, they are especially important for wireless networks given the capacity constraints they face based on spectrum limitations. Third, Internet access providers offering both wireline and wireless broadband services continue to invest heavily in their networks, but the investment demands for wireless broadband service providers are particularly great as they have to deal with spectrum scarcity and the need to deploy new technology to meet the needs of growing numbers of subscribers and expanding mobile broadband usage. Moreover, the value of investments in innovative network technologies, such as 5G, that promise to deliver dramatically higher speeds to individual users are particularly large. Avoiding inflexible rules that discourage this innovation and investment will increase the degree to which mobile broadband Internet access services provide an effective competitive alternative to fixed-line services.

4. The remainder of this declaration explains these findings in greater depth and provides details of the facts and analysis that led me to reach them.

II. THE COMMISSION’S FUNDAMENTAL APPROACH TO REGULATING INTERNET ACCESS PROVIDERS SHOULD BE TO PROMOTE AND PROTECT UNDISTORTED COMPETITION.

5. The central question of the design and implementation of Commission policy toward broadband Internet access providers should be: What regulatory regime best promotes consumer welfare? As I now discuss, the answer is: a regime that promotes and protects undistorted competition. As I will also discuss, in order to promote consumer welfare, it is essential that the regulatory regime not deny broadband Internet access providers the flexibility and incentives needed to make the innovations and investments necessary to meet consumers’ evolving demands.

6. In recent decades, the Commission has overseen a fundamental shift in telecommunications policy from an approach that created and regulated monopolies to one that promotes competition and relies on market forces to “regulate” provider behavior. This shift has given rise to tremendous consumer benefits in a wide range of services, including long distance telephony, multichannel video distribution, and mobile wireless voice and data services. With appropriate public policies in place, competition will continue to generate consumer benefits in the Internet access marketplace in the form of lower prices, greater variety, and higher product and service quality.

A. FLEXIBILITY HAS BEEN KEY TO THE INTERNET’S SUCCESS IN GENERATING CONSUMER BENEFITS.

7. Public policies promote consumer welfare when they create an economic environment in which firms have incentives to engage in investment and innovation that satisfy consumer demands. Given the complexity, variety, and changing nature of consumer demands, this is

best done by promoting undistorted competition. Public policies that attempt to dictate the course of market evolution are unlikely to serve consumer interests.

8. Market experience demonstrates that consumers differ widely in the importance that they attach to different characteristics of their Internet experience. Some customers prefer a highly managed approach with strong security, while others prefer a “simple pipe.” Some customers prefer to make use of bandwidth-intensive applications, such as streaming media, while other customers prefer to use their service for e-mail and other applications that require relatively little bandwidth.

9. Well-informed consumers are the best judges of their own preferences. Given the diversity of consumer preferences in the broadband user population, consumer welfare is maximized when consumers are free to choose from among a range of different types of user experiences. Of course, it is not efficient to offer every conceivable type of user experience—at some point, the cost of additional variety outweighs the benefit. Market forces can better determine the range of experiences to offer consumers than can regulators.

10. In response to competitive pressures and consumer demands, providers of fixed-line broadband Internet access offer a range of speeds, while mobile wireless broadband Internet access providers offer a variety of speeds, access devices, and applications. Providers also offer a variety of business models, with varying degrees of integration between content, access devices, and access services.

11. In a competitive marketplace, those companies that satisfy consumers’ needs and desires earn greater financial returns than those that do not. Competition thus drives firms to

act to the benefit of consumers and can play an important role both in promoting innovation and investment and in ensuring that the benefits of that innovation and investment accrue to consumers. It follows that policies that protect competition serve to promote consumer welfare. It also follows that policies that distort competition generally harm consumer welfare.

12. Public policy is very unlikely to serve consumer interests when it substitutes regulatory mandates for broadband Internet access providers' business judgments regarding which products to offer consumers and what business models to pursue. One important reason why relying on competitive market forces is superior to regulatory fiat is that regulators almost inevitably lack the information necessary to determine which supplier actions will maximize consumer welfare. Network management and new business models are both prime examples. This conclusion is not a criticism of the Commission's abilities but rather a statement about the difficulty of the problem. No one can say with certainty what the best approach is, including the firms themselves, which is why we observe a variety of practices as firms seek to find the best approach for their particular circumstances. There may not be a single approach that is optimal in all circumstances. And, even if there were a unique optimal approach, at present no one may know for certain what it is. Instead, different entities have different views and opinions based on different experiences, skills, information, and analyses.

13. Like the Commission, network operators face a problem that is too difficult to solve with certainty. This is precisely why consumer welfare is best promoted by relying on competitive market forces and why flexibility and experimentation are valuable. In the

absence of restrictive regulations, suppliers in a competitive market will experiment with a diverse array of approaches, and those approaches that are most successful at creating consumer value will prevail. Broadband Internet access providers that adopt inefficient network-management practices, business or pricing models, or other strategies that consumers find objectionable will face pressures to change and will suffer adverse commercial consequences if they do not. In order to promote consumer welfare, the Commission should not implement a rule that would hamper access providers' abilities to experiment with new business models or services, or to engage in undertake complex network management practices, unless that conduct is specifically found to harm competition.

14. Public policy is also very unlikely to serve consumer interests when it favors some sectors of the Internet ecosystem over others, say by forcing one sector to abide by rules designed to make another sector's business models more profitable. Instead, consumer interests are best served by public policies that promote undistorted competition in all sectors of the Internet ecosystem.

15. In summary, consumers are offered a wide range of experiences using both fixed-line and mobile wireless Internet access. The wide array of choices available benefits consumers, both by offering a range of options that satisfy varied consumer demand today and by allowing for the testing of alternative approaches (including different pricing models) to see which will be the most successful in meeting consumer demands in the future. To further the goal of maximizing consumer welfare, the Commission should adopt policies that promote and protect the competitive process, allowing consumer preferences to determine winners and losers in a marketplace characterized by undistorted competition. No one knows the "best"

structure for the Internet. Indeed, given the heterogeneity of consumer preferences, it is very unlikely that there is a single structure that is best for everyone. Because consumers have different preferences and those preferences change over time, and because technology is constantly evolving, it is important to continue to allow a variety of approaches to be taken and for experimentation to take place.

B. PRIVATE INVESTMENT AND INNOVATION IN BROADBAND ACCESS NETWORKS ARE VITAL TO CONSUMER WELFARE.

16. Consumers have benefited from tremendous innovation and investment both at the edge and in the core of the Internet.³ The parallel paths are not a coincidence. Internet services are an example of a *systems* service or product—consumer benefits are generated when several different components (*e.g.*, network equipment and protocols, personal computers or wireless handsets, and applications) are used together. Each of these components interacts with, and depends upon, other components in the system. For example, applications that make intensive use of bandwidth, such as streaming video, require networks that are capable of providing the bandwidth, operating systems that are capable of processing the data, and hardware that is capable of displaying the output. It should also be recognized that the investment in core networks necessary to support edge innovation is not limited to increased capacity. For example, AT&T had to make several investments in its network

³ For a discussion of wireless innovation and investment, see Michael L. Katz, “Public Policy Principles for Promoting Efficient Wireless Innovation and Investment,” Attachment to Comments of AT&T, Inc., *Fostering Innovation and Investment in the Wireless Communications Market; A National Broadband Plan For Our Future*, GN Docket Nos. 09-157, FCC 09-51, September 30, 2009, available at http://www.att.com/Common/about_us/public_policy/fcc_wireless_noi/Paper-Katz.pdf, site visited July 14, 2014 (hereinafter, *Katz Innovation White Paper*).

hardware and software to support the introduction of the Apple iPhone.⁴ And IPv6 allows for several improvements in core network performance that would enable new or improved applications.⁵

17. Evolving consumer demands and technology are creating new opportunities that require significant network investment to realize. New applications and new types of access devices (*e.g.*, smartphones and tablets), as well as increases in the numbers of users and access devices, will continue to place increasing demands on broadband Internet access networks. So, too, will the continuing growth in the streaming and downloading video over the Internet, particularly high-definition video.⁶ These new applications and video streaming are expected to require significant amounts of additional bandwidth.⁷

18. Consumers will continue to enjoy the full potential benefits of services provided by the Internet only if there is significant continuing investment in access networks. There is widespread agreement that the vast majority of investment in innovation and facilities for U.S.

⁴ *Katz Innovation White Paper*, ¶ 50.

⁵ Ger van den Broek, “Next Generation Applications Working Group Report,” IPv6 Task Force, February 4, 2001, *available at* <http://www.eu.ipv6tf.org/PublicDocuments/IPv6TF-Apps.pdf>, *site visited* July 14, 2014, at 3.

⁶ For example, in the second half of 2013, Netflix and YouTube accounted for over 50 percent of broadband traffic at peak times on wireline broadband networks. (Parks Associates, “New Trends in Digital Delivery and CDNs,” 2014, at vi.) Moreover, video’s share of Internet traffic is expected to grow from 57 percent in 2012 to 69 percent in 2017. (*Id.* at 9.)

⁷ For example, the Commission’s Broadband Speed Guide indicates that, at a minimum, consumers need a download speed of 4 Mbps to adequately stream HD video content. (“Broadband Speed Guide,” *available at* <http://www.fcc.gov/guides/broadband-speed-guide>, *site visited* June 19, 2014). Similarly, Netflix recommends a connection of at least 5 Mbps for HD video and 25 Mbps for streaming Ultra HD 4K quality video. (“Netflix Internet Connection Speed Recommendations,” *available at* <https://help.netflix.com/en/node/306>, *site visited* June 19, 2014.)

broadband Internet access will be made by private parties, who will be motivated by the prospect of profits generated by those investments. All else equal, the greater the expected financial return from a given level of investment, the greater are the incentives to undertake that investment. Conversely, public policies that reduce the financial returns to investment weaken private investment incentives. Thus, it is essential to consumer welfare that public policies do not harm private investment incentives. These considerations are especially important in the light of the fact that many investments in broadband networks involve large sunk costs and highly uncertain returns.

III. TRANSPARENCY REQUIREMENTS

19. In the *Open Internet Order*, the Commission adopted the following rule:⁸

A person engaged in the provision of broadband Internet access service shall publicly disclose accurate information regarding the network management practices, performance, and commercial terms of its broadband Internet access services sufficient for consumers to make informed choices regarding the use of such services and for content, application, service, and device providers to develop, market, and maintain Internet offerings.

The *NPRM* concludes that the rule leads to disclosures that:⁹

(1) help end users make informed choices regarding the purchase and use of broadband services and increase end users' confidence in broadband providers' practices; (2) ensure that edge providers have access to broadband providers' network information necessary to develop innovative new applications and services; and (3) inform the Internet community and the Commission about broadband providers' practices and conduct that could impact Internet openness.

⁸ Federal Communications Commission, Report and Order, Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191 (rel. December 23, 2010) (hereinafter, *Open Internet Order*), ¶ 54 [internal footnote omitted].

⁹ *NPRM*, ¶ 66.

20. Transparency regarding available service offerings and network management practices can promote competition and consumer welfare by allowing consumers to make better-informed choices. In the other direction, competition can promote transparency (as firms are driven by market forces to provide information to their customers) *if* consumers know what to ask for (in other words, if consumers know what they don't know). These facts suggest that public policy can play a valuable role in promoting transparency and competition by educating consumers with respect to what questions they should ask service providers. There may also be instances in which competitive forces alone are insufficient to promote efficient disclosure or to prevent fraud, so that public policy oversight is required.

21. In order to promote competition and consumer welfare, the Commission's transparency policy should: (a) generate information that aids decision making by real-world consumers; (b) be flexible with creating excessive uncertainty; (c) recognize the possibility of adverse unintended consequences; and (d) account for the presence of existing consumer protection laws and policies.

22. There is a risk that some of the information the Commission seeks to make available may be unintelligible to most end users. The Commission has tentatively concluded that it "should require that broadband providers disclose meaningful information regarding the source, location, timing, speed, packet loss, and duration of network congestion."¹⁰ It is unclear how providers would disseminate such information to end users that in fact would be meaningful. The Commission itself

¹⁰ *NPRM*, ¶ 83.

recognizes that “the manner in which providers display information to consumers can have as much impact on consumer decisions as the information itself.”¹¹ It is unlikely that the economic benefit of providing potentially esoteric network information to end users would outweigh the economic costs to both providers and end users.

23. Moreover, the Commission’s transparency rule should be properly cabined to ensure that broadband Internet access providers are responsible for reporting only on the sources of congestion for which they are responsible, while recognizing that the decisions and practices of others in the Internet ecosystem likewise affect performance and end users’ experiences. Although the *NPRM* asks whether broadband Internet access providers should be required to make heightened disclosures concerning congestion, the *NPRM* ignores the fact that congestion affecting end users’ experiences may be caused by the decisions of content providers, transit providers, content delivery networks, or others about how to route traffic, interconnect with other networks, or ensure adequate server capacity, among other things. To require broadband Internet access providers to disclose performance information unrelated to their own facilities or services is potentially misleading to consumers. The recent dispute between Netflix and Verizon highlights this issue. Netflix has publicly blamed Verizon for the poor performance that subscribers have experienced while streaming Netflix, but evidence suggests that Netflix’s own network practices have played a

¹¹ *NPRM*, ¶ 72 [internal footnotes omitted].

significant role.¹²

24. If not properly implemented, the transparency rule risks creating unnecessary uncertainty and burdens, and could mislead or confuse consumers. The current transparency rule, by design, allows a broadband Internet access provider considerable flexibility in satisfying the requirements. This flexibility is an important virtue because there are many forms that network management practices and disclosure of those practices could take. Moreover, some networks have frequent, temporary changes in network performance due to maintenance, damage issues, or spikes in user demand. Providing consumers with real-time updates is useful in some circumstances, but some measure of average performance may be a sounder basis on which to choose among access providers. The complexity of these issues increases the likelihood of adverse unintended consequences if the Commission were to try to write detailed, prescriptive regulations.

25. Although the general nature of the proposed rule creates flexibility, it also risks creating uncertainty that could distort access provider behavior or lead to needless misunderstandings that trigger costly administrative proceedings. It is my understanding that, to date, the Commission has done a good job balancing the value

¹² Dan Rayburn, “New Data Questions Netflix’s Assertion That ISPs Are At Fault For Poor Quality,” Streaming Media Blog, *available at* <http://blog.streamingmedia.com/2014/06/netflix-isp-newdata.html>, *site visited* July 10, 2014 (“When Netflix took over the routing controls for their video traffic with their own CDN Open Connect, customer performance began to suffer as highlighted in Netflix’s own data that they shared with the Washington Post.”); Ben Popper, “The war of words continues: Verizon says Netflix is the one causing internet congestion,” *The Verge*, *available at* <http://www.theverge.com/2014/7/10/5888239/verizon-netflix-congestion>, *site visited* July 11, 2014 (“A study by Sandvine found that Netflix was choosing over-utilized transit options for its data when it had clear alternatives, a decision that resulted in performance issues.”)

of flexibility and the value of certainty. It should continue this approach rather than attempt to dictate precise forms of disclosure.

26. It is well documented that even well-intentioned regulations can impose significant costs and often have harmful unintended consequences.¹³ Given that the proposed rules would inevitably have costs, it is important to establish that the rules would have significant benefits that would outweigh these costs. In particular, a policy approach that seeks to maximize consumer welfare would not impose new rules before demonstrating that there is a need for such rules to supplement existing ones.

27. Even where public policies mandating disclosure are potentially valuable, it is not evident that sector-specific rules are necessary and—if they are—whether the Commission should be the agency to impose them. There already exists a range of state and federal laws and public policies of general applicability that provide fundamental consumer protections. Additional, sector-specific rules may be redundant or may conflict with existing rules. And

¹³ Examples of unintended harmful effects from regulation include:

- Rate of return regulation, from which regulators have largely moved away because of concerns about inefficient production, overcapitalization, and negative effects on quality and new service offerings. (Dennis Carlton and Jeffrey Perloff, *Modern Industrial Organization* (Fourth Edition), 2005, at 707-714.)
- The stringent conditions intended to promote public safety radio that were attached to the D Block in the 700 MHz auction. The bids did not reach the reserve price, and the Commission instituted a new proceeding to modify the requirements and modify the reserve price. (Federal Communications Commission, Second Further Notice of Proposed Rulemaking, WT Docket No. 06-150, May 14, 2008.) Consequently, the conditions did not promote public safety radio and the failure to auction the spectrum rights led to delays in the introduction of services using this spectrum.
- Food labeling has had little success in changing diets. For example, reduced consumption of one high-fat food is frequently offset by increased consumption of another high-fat food. (See Omri Ben-Shahar and Carl E. Schneider (2011) “The Failure of Mandated Disclosure,” *University of Pennsylvania Law Review*, **159** (3): 647-749, at 677.)

an advantage of economy-wide rules is that a well-developed body of case law and precedent has already been developed. This established regime has the advantage of being relatively flexible while at the same time providing a less uncertain environment for investors and innovators than would a new set of sector-specific rules. For example, the Federal Trade Commission has extensive experience with consumer protection policy, and private-sector firms also have extensive experience complying with the Federal Trade Commission's policies.

IV. THE NO-BLOCKING RULE

28. The Commission tentatively concludes that it should adopt the following rule:¹⁴

A person engaged in the provision of fixed broadband Internet access service, insofar as such person is so engaged, shall not block lawful content, applications, services, or nonharmful devices, subject to reasonable network management.

A person engaged in the provision of mobile broadband Internet access service, insofar as such person is so engaged, shall not block consumers from accessing lawful websites, subject to reasonable network management; nor shall such person block applications that compete with the provider's voice or video telephony services, subject to reasonable network management.

29. For the reasons described in Section II above, the focus of this rule should be on preventing practices that harm competition. A public policy that prevents broadband Internet access providers from using blocking to harm competition can serve consumer interests. Indeed, such a policy already is in force in the form of antitrust policy: when it can be demonstrated to harm competition, foreclosure is an antitrust violation. It should be

¹⁴ *NPRM*, ¶ 94 [internal footnotes omitted].

recognized that the presence of a vigorous antitrust enforcement regime attenuates the benefits of the Commission's imposing a no-blocking rule.

30. As some proponents of network neutrality regulation have argued, there are conditions under which an integrated supplier with significant market power will find it profitable to use that market power to exclude rival edge providers, harming competition and consumers. However, it is far from a foregone conclusion that such an integrated service provider will engage in such exclusion¹⁵ or that instances in which a vertically integrated supplier appears to favor its own applications or content are anticompetitive.¹⁶ I am unaware of any evidence indicating that there was a widespread problem of anticompetitive foreclosure by broadband Internet access providers prior to imposition of the anti-blocking requirements of the *Open Internet Order*.¹⁷ I am similarly unaware of any evidence indicating that current public policies, including antitrust enforcement, are not up to the task of preventing anticompetitive

¹⁵ Joseph Farrell and Phil Weiser (2003), "Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age," *Harvard Journal of Law and Technology*, 17(1), available at <http://jolt.law.harvard.edu/articles/pdf/v17/17HarvJLTech085.pdf>, site visited July 14, 2014.

¹⁶ Instead, such favoritism may actually reflect efficiency benefits of greater coordination facilitated by integration that result in higher levels of consumer welfare.

¹⁷ 47 C.F.R. § 8.5.

The NPRM preceding the *Open Internet Order* identified only two incidents in which the Commission perceived the need to take action against an Internet service provider's blocking or degrading of traffic. (Federal Communications Commission, Notice of Proposed Rulemaking, Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191, WC Docket No. 07-52 (rel. October 22, 2009), ¶¶ 32, 36, and 50. Moreover, in 2007, a staff report of the Federal Trade Commission stated that "to date we are unaware of any significant market failure or demonstrated consumer harm from conduct by broadband providers." (Federal Trade Commission, "Broadband Connectivity Competition Policy," Staff Report, June 2007, available at <http://www.ftc.gov/reports/broadband/v070000report.pdf>, site visited July 7, 2014, at 11.)

foreclosure. Lastly, major service providers have publicly committed not to block access to any legal content or applications that their customers seek to access.¹⁸ Hence, there is no reason to expect that additional regulations targeted specifically at such practices would significantly promote competition and consumer welfare.

31. It should also be recognized that an overly broad interpretation of “blocking” can distort or stifle competition and harm consumers. That is one of the central reasons why antitrust enforcement requires evidence that the challenged conduct harms competition and, thus, consumers. It is also a reason why the Commission should create one or more safe harbors or presumptions that define practices presumed reasonable and that do not constitute blocking. The *NPRM* addresses this issue by proposing to allow “individualized bargaining” for levels of service above a baseline level of Internet access.¹⁹ The *NPRM* also notes that:²⁰

One way to define a minimum level of access is as a requirement that broadband providers apply no less than a “best effort” standard to deliver traffic to end users. For any particular type of Internet traffic, best-effort delivery would represent the “typical” level of service for that type of traffic—in effect, routing traffic according to the “traditional” architecture of the Internet. Broadband providers would be free to negotiate “better than typical” delivery with edge providers, and would be prohibited (subject to reasonable network management) from delivering “worse than typical” service in the form

¹⁸ See, for example, Verizon, “Verizon’s Commitment to Our Broadband Internet Access Customers: Our Customers Get Everything the Open Internet Has to Offer,” *available at* <http://responsibility.verizon.com/broadband-commitment/>, *site visited* July 10, 2014 (“On any of our Internet access services, wireline or wireless, you and other users of our service can access and use the legal content, applications, and services of your choice, regardless of their source.”) and Josh Lowensohn, “Comcast, Verizon, and others promise net neutrality ruling won’t hurt customers,” *The Verge*, *available at* <http://www.theverge.com/2014/1/14/5309268/comcast-verizon-and-others-promise-net-neutrality-ruling-wont-hurt>, *site visited* July 9, 2014.

¹⁹ *NPRM*, ¶ 95.

²⁰ *NPRM*, ¶ 102 [internal footnotes omitted].

of degradation or outright blocking.

32. A carefully crafted rule that ensures that traffic will not be blocked or degraded over an end user’s best-effort Internet access service would provide assurances that end users could access the content and applications that they desire and that edge providers would continue to have a path to reach end users. That said, the Commission’s proposal to define a specific minimum level of access based on the “typical” level of service for a given type of traffic is problematic. For instance, typical cannot be defined as the mean or average level because it is a simple fact of arithmetic that—unless all traffic is treated identically—some traffic has to receive below-average treatment.

33. From the perspective of protecting competition and promoting consumer welfare, a better approach than setting a hard-and-fast minimum based on problematic interpretations of what is typical would be to establish a zone of reasonableness (rather than a specific minimum) and to do so by relying on market metrics: specifically, end users’ broadband Internet access choices. As long as an access provider does not engage in source-based blocking or degradation of traffic relative to the level of best-effort Internet access service an end user reasonably expects based on the service he or she has purchased, the no-blocking rule should allow arrangements offering service above the baseline selected by the end user.

34. As the *NPRM* acknowledges, there are important differences between fixed and mobile broadband Internet access providers.²¹ As a result of these differences, there are heightened concerns with respect to applying the no-blocking rule to mobile broadband Internet access providers. The Commission proposes to “prohibit mobile broadband providers from blocking lawful web content as well as applications that compete with the mobile broadband providers’ own voice or video telephony services, subject to reasonable network management.”²² The Commission also²³

seek[s] comment on whether it would serve the public interest to expand the rule’s scope to include reasonable access to all applications that compete with the mobile broadband Internet access provider’s other services, not just those that compete with voice or video telephony services, subject to reasonable network management practices.

The benefits of such an extension would be low and the risks of harm high given the lack of evidence of a widespread problem today, the fact that the United States has vigorous antitrust enforcement, and the characteristics of the mobile wireless industry described in Section VI below.

V. COMMERCIALY REASONABLE PRACTICES

35. The Commission tentatively concludes it “should adopt a rule requiring broadband providers to use ‘commercially reasonable’ practices in the provision of broadband Internet access service.”²⁴

²¹ *NPRM*, ¶ 140.

²² *NPRM*, ¶ 105.

²³ *NPRM*, ¶ 106.

²⁴ *NPRM*, ¶ 116.

36. Unless properly formulated and applied, such a rule could discourage the use of efficient network management and block or slow the emergence of new pricing and service models that could otherwise benefit consumers. Such arrangements could facilitate the entry of new edge providers and promote efficient, pro-consumer behavior by incumbent edge providers. Because no one has the ability to predict what will be the best network management practices and pricing and service models in the future, it is important that the Commission’s rule be flexible and remain focused on addressing only those practices that demonstrably harm competition. A case-by-case (or rule-of-reason) approach can offer that flexibility. At the same time, such an approach risks creating uncertainty that could distort provider behavior or trigger costly administrative proceedings. Contrary to the *NPRM*’s assertion, a rule-of-reason, approach does not provide certainty²⁵ unless either: (a) there is a substantial record of adjudication, or (b) there are realistic safe harbors. The approach is workable, however, if the Commission develops a set of well-constructed safe harbors or presumptions that are reasonably available to broadband Internet access providers.

A. POTENTIAL GUIDING FACTORS

37. *NPRM* identifies several factors as potential guideposts.²⁶ The Commission proposes the impact on present and future competition and the impact on consumers as two, distinct

²⁵ *NPRM*, ¶ 136.

²⁶ In addition to the factors discussed below, the Commission “propose[s] to adopt a factor or factors in applying the commercially reasonable standard that assess the impact of broadband provider practices on free exercise of speech and civic engagement” on the grounds that free speech promotes broadband investment and deployment. (*NPRM*, ¶ 131.) However important is the objective of promoting free speech, it is difficult, if not impossible, to see any genuine link between free speech and the concept of “commercially reasonable.” Instead, adopting

guiding factors.²⁷ In fact, these two factors can and should be combined. Consideration of the impact on consumers should be subsumed within consideration of the impact on competition because the best way for the Commission’s rules to promote consumer welfare is for the rules to promote competition. More specifically, consumer welfare is best protected if the Commission allows broadband Internet access service providers to manage their networks and—if they so choose—offer differentiated services or implement sophisticated pricing strategies as long as those practices do not harm competition.

38. In assessing whether a practice harms competition, it is essential not to confuse harm to competitors with harm to competition.²⁸ The Commission has stated “We believe that consumers of broadband access service should have the ability to exercise meaningful choices.”²⁹ Those choices should include services offered by edge providers that have chosen to enter arrangements for differential treatment in order to offer more desirable services to their customers. Such options will benefit consumers, even as they reduce rival edge providers’ economic welfare by increasing the competitive pressure they face.

39. The *NPRM* also raises technical characteristics as a potential guiding factor.³⁰ The Commission is correct to be concerned that application of any reasonableness rule should be sensitive to the technical characteristics of the network involved. It should be recognized,

this guideline would amount to imposition of a public-interest or universal-service obligation of the sort imposed on regulated monopoly, common carriers.

²⁷ *NPRM*, ¶¶ 124 and 129.

²⁸ It is also important to keep in mind the existence of current antitrust enforcement, which limits potential harms from firm misconduct.

²⁹ *NPRM*, ¶ 130.

³⁰ *NPRM*, ¶ 132.

however, that there is a potential tension between the static and dynamic application of such a factor. On the one hand, allowing less-capable networks more regulatory leeway could promote efficiency to the extent that such networks are less able to adapt to the regulatory requirements. On the other hand, such a policy acts as a tax on investment in network capabilities when such investment triggers more stringent regulatory requirements.

40. Lastly, the *NPRM* also raises industry practices as a potential guiding factor.³¹ It is a sensible approach to presume that widely adopted practices are reasonable, especially when agreed to through multi-stakeholder forums or previously approved by the Commission.

B. LIMITATIONS ON DIFFERENTIATED ARRANGEMENTS BETWEEN LAST-MILE ACCESS PROVIDERS AND EDGE PROVIDERS WOULD VERY LIKELY HARM COMPETITION AND CONSUMERS.

41. The Commission seeks comment on whether it should permit broadband Internet access providers to enter into differentiated arrangements with edge providers, or, alternatively, restrict or prohibit some or all types of differentiated arrangements.³² The Commission also asks a series of questions regarding broadband providers' incentives and economic ability to engage in certain conduct:³³

To what extent do broadband providers today have economic incentives and mechanisms to block or disadvantage a particular edge provider or class of edge providers? To what extent do vertically integrated providers have particularized incentives to discriminate—on price, quality, or other bases—in favor of affiliated products? What are broadband providers' incentives to increase revenues by charging edge providers for access or prioritized access to the broadband provider's end users?

³¹ *NPRM*, ¶ 134.

³² *NPRM*, ¶¶ 89, 90, 111, and 138.

³³ *NPRM*, ¶ 44.

42. Before considering the merits of permitting, limiting, or banning differentiated arrangements between last-mile Internet access providers and edge providers for differential treatment, it is worth commenting on per se regulatory rules generally. Given the continuing evolution of the market and the value of experimentation and flexibility, it is difficult—if not impossible—to conceive of circumstances in which a rebuttable presumption of harm would not be preferable to a per se prohibition of a given practice.

43. Applications differ greatly in the requirements they place on a network.³⁴ Some applications require little bandwidth and are not time sensitive, such as e-mail. Other applications require significant bandwidth but are not time sensitive, such as downloading software or (non-streaming) video. Still other applications are time sensitive and require significant bandwidth, such as high-quality videoconferencing. The speeds applications are projected to require in the near future range from a few kilobits per second for VoIP or music, to several megabits per second for streaming television or games, and up to twenty-five megabits per second for the latest video streaming resolution, Ultra HD 4K.³⁵ In the light of these differences among applications, it should not be surprising that the current Internet

³⁴ Applications also differ greatly in terms of their sensitivity to various quality of service metrics, including delay, jitter, throughput, and packet loss. (See, for example, Broadband Internet Technical Advisory Group, “Real-time Network Management of Internet Congestion,” October 2013, § 3.5.)

³⁵ The Commission’s Broadband Speed Guide indicates that consumers need a download speed of only 0.5 Mbps for VoIP, but need 4 Mbps for HD video streaming. (“Federal Communications Commission Broadband Speed Guide,” *available at* <http://www.fcc.gov/guides/broadband-speed-guide>, *site visited* June 19, 2014.) Similarly, Netflix recommends a connection speed of at least 5 Mbps for HD video and 25 Mbps for Ultra HD 4K quality video. (“Netflix Internet Connection Speed Recommendations,” *available at* <https://help.netflix.com/en/node/306>, *site visited* June 19, 2014.)

architecture favors some applications over others. More important, the diversity of needs and preferences implies that variety, differentiation, and experimentation all can be valuable.

44. It is commonplace for firms in the Internet ecosystem other than access providers to offer multiple versions of their products and to do so under a variety of different business models. For example, Hulu offers a baseline level of access to programming on an advertiser-supported basis while Hulu Plus offers a wider range of access devices, greater content variety, and higher video quality but requires end users to pay subscription fees.³⁶

45. It is also common for edge providers to enter into arrangements to differentiate treatment of their traffic in parts of the Internet other than the last mile. For instance, content providers already purchase differential treatment through self-supply or third-party CDNs, such as Akamai, Limelight and Tata/BitGravity, which sell services that improve the speed and quality at which their customers' content can be accessed by end users. One way in which a CDN can improve performance is by maintaining a large number of diverse servers that connect to the Internet near end users' locations, thereby reducing the number of hops between an edge provider's content and end users. Similarly, large content providers, such as Google, Microsoft, and Yahoo, operate private backbone networks that connect to the Internet and allow those providers to enjoy higher quality transport of their packets than that available on the public Internet.³⁷

³⁶ Hulu, Frequently Asked Questions, available at <http://www.hulu.com/plus>, site visited July 8, 2014.

³⁷ Drew Fitzgerald and Spencer E. Ante, "Tech Firms Push to Control Web's Pipes," *The Wall Street Journal* (Online), available at <http://online.wsj.com/news/articles/SB10001424052702304173704579262361885883936>, site

46. The Commission should prohibit only differentiated arrangements between edge providers and last-mile broadband Internet access providers that demonstrably harm competition, rather than broadly prohibiting practices that could well enhance competition and increase consumer welfare in a variety of contexts. For example, an edge provider might want to enter into a differentiated access arrangement as part of a disruptive strategy that could benefit end users by creating a new option for them and increasing the competitive pressures faced by rival edge providers. It is also essential that the regulation be designed taking into account the costs—including the likely costs of unintended consequences—and the presence of existing antitrust and regulatory policies.

47. Arguments against differentiated arrangements confuse harm to specific competitors with harm to competition.³⁸ Allowing an edge provider to enter into differentiated arrangements to improve its service is a pro-competitive action. For example, such an arrangement might be an important component of a new entrant’s strategy for challenging well-established incumbents, such as Google, Netflix, and Facebook, that already prioritize traffic on their own networks. Precisely because it increases competitive pressures on rival edge providers, such expenditures harm those rivals. To assert that such harm to competitors constitutes harm to competition is to misunderstand completely the competitive process and how it generates consumer benefits. Imposition of sweeping restrictions or prohibition of

visited July 10, 2014. See also, Craig Labovitz, “How Big is Google?” Arbor Networks, available at <http://www.arbornetworks.com/asert/2010/03/how-big-is-google/>, site visited July 10, 2014.

³⁸ Indeed, this confusion by opponents applies to differential treatment of edge providers by Internet access providers generally (*e.g.*, sponsored data and two-sided pricing).

differentiated arrangements thus risks becoming the Robinson-Patman Act for the Internet age in that it is an anticompetitive policy masquerading as a pro-competitive one.

48. Another way to see the flaw in the arguments calling for sweeping restrictions on—or a prohibition of—differentiated agreements is to trace out the implications of those arguments in other contexts. For example, applying the logic of opponents to differentiated agreements, a restaurant would not be allowed to buy and serve more expensive, organic poultry on the grounds that buying a superior input would disadvantage other restaurants that could not afford to pay for organic poultry given their market positions. The logic of opponents to differentiated arrangements could be used to argue for pervasive regulation of many information and communication technology firms. For example, one could argue that use of Microsoft Office could be very valuable to small firms but some of those firms find paying for the software to be financially burdensome. Should Microsoft be forced to provide Office for free in order to avoid reducing innovation by Office users and to ensure that there is no “discrimination” against smaller companies that are less able to pay for software licenses than are large companies? Should Microsoft have to provide Office for free given that its marginal costs are near zero and selling Office creates a virtuous cycle that promotes the sales of Windows?

49. Similar arguments could be made with respect to Google’s web search services. The treatment by Google search is arguably more important to the success of many edge providers than are the precise characteristics of how that traffic is delivered over the last mile. By the logic of many arguments against differentiated arrangements, Google should be prevented from selling advertisements, which amount to differentiated search, on the grounds that doing

so disfavors firms that might not be able to “afford” such ads. The appropriate conclusion is *not* that regulation should be extended to Google’s web search service. Rather, the appropriate conclusion is that the approach advocated by many opponents of differentiated arrangements would find a need for regulation even where there is none.

C. SAFE HARBORS AND PRESUMPTIONS OF REASONABLENESS

50. The *NPRM* identifies possible safe harbors.³⁹ These would play an important role in providing a degree of certainty to industry participants while allowing the Commission to pursue a flexible, case-by-case approach toward practices outside of the safe harbors. In addition to absolute safe harbors, the Commission should also create rebuttable presumptions of reasonableness for certain practices unlikely to harm competition. Other parties and/or the Commission could seek to rebut the presumption of reasonableness on a case-by-case basis, but the evidentiary burden would be on the party seeking to have the practice or conduct determined to be unreasonable.

1. Non-Exclusive, Non-Affiliated Agreements

51. The Commission is considering creating a safe harbor for non-exclusive deals offered to non-affiliated entities.⁴⁰ This approach is a sound one. The key point to recognize is that the focus of the rule should be on potential harm to competition and whether certain practices harm competition by differentially treating competing edge providers. If a deal is offered on a

³⁹ *NPRM*, § III.E.4. Among the safe harbors, the Commission has tentatively concluded to continue its approach of 2010 by excluding mobile broadband providers from the no commercially unreasonable practices rule. (*NPRM*, ¶¶ 62 and 140.) For the reasons discussed in Section VI below, this exclusion would promote undistorted competition and benefit consumers.

⁴⁰ *NPRM*, ¶ 141.

non-exclusive basis, then other edge providers can avail themselves of that deal if they believe it will allow them to better differentiate their services or in some other way compete more effectively. The non-exclusivity would ensure that the Internet access provider could not “leverage” any market power that it might possess to harm competition in the relevant market for edge provider services.

2. Sufficient Competition and Practices Already Used by Other Broadband Internet Access Providers

52. In areas where consumers can choose among competing broadband Internet access providers—particularly if more than one provider is offering very-high-speed access services—there is less concern that an access provider will adopt policies that harm competition among edge providers because attempts to do so may trigger consumers to switch access providers. In addition to having less concern about the competitive effects of differentiated arrangements, there is greater concern that regulation will impose costs by reducing flexibility and discouraging experimentation. Competing broadband Internet access providers may experiment with various ways to differentiate themselves from one another in order to gain competitive advantage. The greater the degree of competition, the less concern there will be that a given provider’s practices harm competition and consumers.

53. The Commission should also consider adopting a presumption of reasonableness where a firm can demonstrate that its practice has been undertaken by one or more firms facing sufficient competition (possibly in geographic markets other than the one in which the firm whose practice is at issue competes) or where the Commission has previously found that practice to be commercially reasonable when used by another Internet access provider.

3. Two-Sided Pricing

54. Internet access providers operate two-sided platforms that bring together end users and a wide variety of edge providers offering content and applications. It is commonplace for platforms to charge users on both sides for bringing them together. For example, many newspapers and magazines charge both their advertisers and subscribers. And end users clearly can benefit when edge providers pay for connections. For example, Amazon promotes the simplicity of its bundled offering, the Kindle Paperwhite reader, by stating that “3G wireless connectivity is automatic (with no monthly fees or annual contracts).”⁴¹ Similarly, “Amazon pays for Kindle DX's wireless connectivity so [the Kindle user] won't see a wireless bill.”⁴² Moreover, many automobile manufacturers now offer telematics systems providing a variety of security, navigation, and emergency services through mobile wireless connections using a variety of pricing models including those that bundle the cost of the mobile wireless connection in the price of the telematics service.⁴³ As these nascent industries continues to develop, new business models will almost certainly be deployed involving varying degrees of bundling and integration among applications, access devices, and access services.

⁴¹ Amazon, “Connect to 3G,” *available at* <http://www.amazon.com/gp/help/customer/display.html?nodeId=201301640>, *site visited* June 19, 2014.

⁴² Amazon, “Wireless, Whispernet and Whispersync,” *available at* http://www.amazon.com/gp/help/customer/display.html/ref=help_search_1-2?ie=UTF8&nodeId=200375910&qid=1261384011&sr=1-2#cost, *site visited* June 6, 2014.

⁴³ See, for example, Antuan Goodwin, “Ten telematics systems connect your car to the cloud,” CNET, June 3, 2013, *available at* <http://www.cnet.com/pictures/ten-telematics-systems-connect-your-car-to-the-cloud/>, *site visited* July 14, 2014.

55. Yet, such pricing has been opposed by some in the case of Internet access platforms. As I will now demonstrate, two-sided pricing can be an innovative and valuable component of edge providers' competitive strategies and can benefit consumers. The Commission should not intentionally or unintentionally create barriers to such pricing by leaving it under a cloud of regulatory uncertainty. Instead, the Commission should declare two-sided pricing to be presumptively reasonable. Moreover, this presumption should be rebuttable only if the challenging party can prove concrete harm to competition from the specific practice being challenged.

56. The fundamental rationale for a presumption of reasonableness is that an edge provider's decision to pay all or part of end users' costs of gaining access to its services improves the value of its services and does not degrade or reduce the value of the services offered by rival edge providers. In other words, it is competition on the merits. Two examples illustrate this point.

57. First, consider an Internet access provider that employs usage-based billing in the form of a flat fee up to a set number of gigabytes per month and incremental fees for usage above the baseline allotment. Suppose that an edge provider pays the Internet access provider so that household subscribers can utilize the edge providers' service without the traffic's counting against the subscribers' usage allotment. All else equal, this fact makes the edge provider's service more attractive to consumers. Consumers will benefit both directly (by taking advantage of the free access) and indirectly (as competitive pressures drive the edge provider's rivals to improve their offerings in response). It is important to recognize that this practice does *not* reduce the benefits associated with rival edge providers' services. Indeed,

by creating headroom within the customer's usage plan, one edge provider's paying for usage could benefit other edge providers.

58. Second, suppose that an Internet access provider charges a set amount per unit of traffic. If one edge provider chooses to pay the traffic-sensitive charges that would otherwise be levied on end users utilizing its service, that conduct has no effect on what it costs end users to utilize rival edge providers' services. Thus, the only "harm" to rival edge providers is that associated with increased competitive pressure.

59. Two-sided pricing arrangements could take many forms and could potentially generate significant consumer benefits, as the following hypothetical examples illustrates. Suppose that a provider announced a policy of excluding the data transmitted by an antivirus app when calculating subscribers' usage levels. Such a strategy could be efficient given that use of antivirus software by one end user confers benefits on other end users, similar to the way that vaccination by one person benefits the rest of the community. Such a strategy could also place greater competitive pressures on rival mobile wireless services providers. Despite these benefits, a policy that forbids differentiated treatment of traffic with respect to pricing, or that did not allow anyone other than the end user to pay for the traffic, would block this beneficial activity. Similarly, there would be clear consumer benefits if an edge provider chose to pay so that its subscribers would get the equivalent of a "speed boost" for its traffic. For example, if a customer subscribes to a 25 Mbps service but an edge provider wants to pay to boost that speed to 50 Mbps when the customer is accessing its service (say for the duration of a large file download), the edge provider's conduct benefits the customer and (presumably) to the edge provider, while increasing competitive pressures on rival edge providers.

60. A recent initiative by T-Mobile also illustrates how innovative pricing arrangements can benefit consumers and competition. T-Mobile has exempted certain music services from counting against its subscribers' data caps.⁴⁴ Presumably, those services that are not part of this policy will cry foul. Yet I am unaware of any reason to believe that T-Mobile has the incentive or ability to significantly harm competition among Internet music services. Instead, this is part of T-Mobile's innovative "Un-carrier" strategy, which has been widely praised by competition authorities and is disrupting the industry and promoting competition among mobile wireless service providers.

61. Lastly, it should again be remembered that edge providers' interests are not fully aligned with end users' interests. For example, end users who do not use bandwidth-hogging applications are harmed when forced to help pay for the consumption of those who do. End users' interests could be better served if edge providers faced price signals that would then influence the design of their applications (*e.g.*, create incentives to design their applications in ways that make efficient use of bandwidth and reduce the burdens placed on access networks).

⁴⁴ T-Mobile's unlimited streaming applies to several music streaming services, including Pandora, Rhapsody, iHeartRadio, iTunes Radio, Slacker, and Spotify, and also to music streaming services from T-Mobile partners, such as Samsung's Milk Music and Beatport/SFX. (T-Mobile, "T-Mobile Sets Your Music Free," available at <http://newsroom.t-mobile.com/news/t-mobile-sets-your-music-free.htm>, site visited July 9, 2014.)

VI. IMPOSING NEW RULES ON MOBILE WIRELESS BROADBAND INTERNET ACCESS PROVIDERS WOULD RISK DISTORTING COMPETITION AND HARMING CONSUMERS.

62. As discussed above, as long as it is properly implemented, continued application of the transparency rule can promote competition and consumer welfare. This conclusion holds for mobile wireless—as well as fixed-line—Internet access. However, there are at least three broad reasons why application of any new rules to wireless broadband Internet access providers poses substantial risks of distorting competition and harming consumers:⁴⁵

- *Competitive market forces already promote consumer welfare in the mobile broadband sector.* Today, several different competitors offer a variety of wireless data and Internet access services. Competition provides incentives for service providers to adopt network management practices and business models that promote consumer welfare. The competitive structure of the wireless marketplace thus reduces the potential benefits of regulation relative to the free-market outcome. Given the strength of competition, there is relatively little reason to believe that pervasive regulatory intervention will improve market performance.
- *Public policies that limit wireless business model innovation and network management are especially harmful in the mobile broadband sector.* Although network management and revenue-and-service model innovation are important to the successful operation of any communications network, they are especially important for

⁴⁵ As the *NPRM* observes, the Commission reached a similar conclusion about characteristics of mobile Internet access that warrant restraint in the application of new rules to mobile broadband providers. (*NPRM*, ¶ 140, citing *Open Internet Order*, ¶¶ 93-98.)

wireless networks given the capacity constraints they face due to the necessity of sharing spectrum resources and the rapidly changing nature of the industry. New pricing models can help drive edge providers and end users to put that limited capacity to its most high-value uses. Moreover, networks offering mobile services face particularly complex operational issues, such as the interaction of the network with millions of mobile transceivers that must be monitored from multiple locations and handed off between different access points. Further, the nature of mobile access devices may make network management practices regarding security and protection from viruses, worms, and other malware particularly valuable. Consumers will benefit if wireless network operators are allowed to undertake network management and to engage in constant experimentation and innovation with respect to various aspects of their business models without public policy creating undue obstacles.

- *Public policies that attenuate broadband mobile wireless network investment incentives will be especially harmful.* Innovation in terms of access devices, edge services, and mobile wireless access networks has the potential to bring tremendous new benefits to end users. Meeting the demands created by that innovation requires very large investments by network owners. The popularity of smart phones, tablets, and other mobile access devices has grown dramatically.⁴⁶ Traffic from wireless and

⁴⁶ The Commission reports that by 2012, 55 percent of wireless consumers used a smartphone. (“Federal Communications Commission 16th Annual Mobile Wireless Competition Report,” March 21, 2013, at 22.) By the end of 2013, smartphones accounted for nearly 70 percent of all mobile phone sales in the U.S. (Bank of America Merrill Lynch, “4Q13 US Wireless Matrix,” March 26, 2014, Chart 3.) A survey by Morgan Stanley found that more than 50

mobile devices are expected to soon exceed traffic from wired devices, and, while PC-originated traffic is expected to grow at an annual growth rate of 14 percent, IP traffic from tablets and mobile phones is expected to grow by 104 percent and 79 percent, respectively.⁴⁷ Wireless broadband providers have invested heavily in high-speed broadband infrastructure in recent years, including the deployment of 4G technology, improvements to existing technologies, and increased geographic coverage. A recent White House report stated that “... during President Obama’s first term, the annual investment in U.S. wireless networks alone grew more than 40 percent from \$21 billion to \$30 billion. Projections for 2013 estimate an annual wireless network investment at \$35 billion.”⁴⁸ And significant investment in wireless infrastructure is expected to continue.⁴⁹ Much of this investment will be in innovative network technologies, such as 5G, that promise to deliver dramatically higher speeds to individual users. Allowing flexibility and encouraging this innovation and investment will make these services more useful and also increase the degree to which mobile wireless Internet access services provide an effective competitive alternative to fixed-line services. The imposition of new rules could attenuate investment incentives,

percent of respondents had a tablet in 2013, up from 20 percent the year before. (Morgan Stanley, “4th Annual Streaming Survey,” March 13, 2013, at 1, 39.)

⁴⁷ Cisco White Paper, “Cisco Visual Networking Index: Forecast and Methodology, 2012-2017,” 2013, at 2.

⁴⁸ Office of Science and Technology Policy and The National Economic Council, “Four Years of Broadband Growth,” June 2013, at 4-5.

⁴⁹ Alan Pearce, J. Richard Carlson, Michael Pagano, “Wireless Broadband Infrastructure: A Catalyst for GDP and Job Growth 2013-2017,” Prepared for PCIA – The Wireless Infrastructure Association – by Information Age Economics, September 2013, Table A.

harming competition and consumers. Whatever one thinks of the potential benefits of network neutrality regulations, those benefits must be weighed against the resulting loss of investment incentives.⁵⁰

63. In summary, the technical constraints faced by mobile wireless networks increase the costs of public policies that hinder efficient network management and attenuate network investment and innovation incentives in this evolving industry. The need for, and complexity of, wireless network management also makes it more likely that Commission regulation of network management will trigger those costs. At the same time, the competitive structure of the wireless marketplace leads to forces that drive service providers to benefit consumers in the absence of pervasive regulation. Thus, the costs of regulating broadband mobile Internet access are likely to be high and the benefits low. For all of these reasons, application of additional rules to mobile wireless broadband Internet access providers is particularly problematic.

VII. CONCLUSION

64. The Commission should employ a pro-consumer approach to policies that address the Internet ecosystem, including broadband Internet access providers. A pro-consumer policy

⁵⁰ One study that did so found that, relative to the baseline in which they were not applied, the openness requirements attached to the C-Block license reduced the expected profitability of the services provided with that license by 32 percent. (George S. Ford, Thomas M. Koutsky, and Lawrence J. Spiwak, “Using Auction Results to Forecast the Impact of Wireless Carterfone Regulation on Wireless Networks,” Phoenix Center Policy Bulletin No. 20, (Second Edition), May 2008.) Although it is difficult to determine the precise effects, the experience of Auction 73 demonstrates that network neutrality regulations can dramatically lower expected network profits.

approach relies primarily on competitive market forces to deliver innovation and investment with existing antitrust and consumer-protection policies serving as a backstop to correct situations in which the market can be shown to have failed. In other words, the Commission's rules should let consumers choose what they want, not mandate the choices to be offered. Instead of imposing sweeping proscriptions of evolving practices, the Commission should adopt a flexible approach that couples case-by-case analysis with well-defined safe harbors and presumptions of reasonableness. To do otherwise would harm consumers by distorting competition and attenuating innovation and investment incentives.

I declare, under penalty of perjury, that the foregoing is true and correct.



Michael L. Katz

July 15, 2014

VIII. APPENDIX: QUALIFICATIONS

65. I hold the Sarin Chair in Strategy and Leadership at the University of California at Berkeley. I hold a joint appointment in the Haas School of Business Administration and in the Department of Economics. I have also served on the faculty of the Department of Economics at Princeton University and the Stern School of Business at New York University. I received my A.B. from Harvard University *summa cum laude* and my doctorate from Oxford University. Both degrees are in Economics.

66. I specialize in the economics of industrial organization, which includes the study of antitrust and regulatory policies. I regularly teach courses on microeconomics and business strategy. I am the co-author of a microeconomics textbook, and I have published numerous articles in academic journals and books. I have written academic articles on issues regarding the economics of network industries, two-sided markets, systems markets, and antitrust enforcement. I am a co-editor of the *Journal of Economics and Management Strategy* and serve on the editorial boards of *Information Economics and Policy* and the *Journal of Industrial Economics*.

67. In addition to my academic experience, I have consulted on the application of economic analysis to issues of antitrust and regulatory policy. I have served as a consultant to both the U.S. Department of Justice and the Federal Communications Commission on issues of antitrust and regulatory policy. I have served as an expert witness before state and federal courts. I have also provided expert testimony before a state regulatory commission and the U.S. Congress.

68. From January 1994 through January 1996, I served as the Chief Economist of the Federal Communications Commission. I participated in the formulation and analysis of policies toward all industries under Commission jurisdiction. As Chief Economist, I oversaw both qualitative and quantitative policy analyses.

69. From September 2001 through January 2003, I served as the Deputy Assistant Attorney General for Economic Analysis at the U.S. Department of Justice. I directed a staff of approximately fifty economists conducting analyses of economic issues arising in both merger and non-merger enforcement. My title as Deputy Assistant Attorney General notwithstanding, I am not an attorney.

EXHIBIT 2

Competition in Broadband and “Internet Openness”

Declaration of Andres V. Lerner

July 15, 2015

Competition in Broadband and “Internet Openness”

Declaration of Andres V. Lerner

July 15, 2014

TABLE OF CONTENTS

I.	Introduction and Overview	1
II.	Competition between Wireline Broadband Providers.....	9
	A. Most consumers have access to two or more wireline broadband providers.....	9
	B. Firm behavior is consistent with significant competition	15
	C. Consumer behavior is consistent with significant competition	20
	D. Consumer benefits from broadband competition.....	22
	E. The increasing role of interconnection arrangements and content delivery networks (CDNs)	25
III.	Competition between Wireless Broadband Providers.....	27
	A. Consumers have many options of mobile broadband providers	27
	B. Firm behavior is consistent with significant competition	28
	C. Consumer behavior is consistent with significant competition	32
	D. Consumer benefits from wireless broadband competition.....	34
	E. Increasing substitution between wireline and wireless broadband	38
IV.	The Future Outlook for Broadband.....	40
	A. Continued growth of consumer demand for broadband	41
	B. Continued investment and innovation competition	46
V.	Implications of Market Competition for Proposed Regulation	48
	A. Limited risk that differential service models, network management, and pricing arrangements would harm consumers and competition.....	49
	B. Differential network management and pricing arrangements have the potential to enhance competition and benefit consumers	50
VI.	Conclusions	52
	Appendix A: Qualifications.....	54

I. Introduction and Overview

1. The Federal Communications Commission (“Commission”) seeks comment on its proposed rules for “protecting and promoting Internet openness.”¹ I have been asked by counsel for Verizon to conduct an economic analysis of competition in the broadband industry, and to comment on the Commission’s proposed rules in light of the nature and degree of such competition.

2. I conclude that, given the significant competition among broadband providers, and the nascent and rapidly changing marketplace, the rules adopted by the Commission should give broadband providers broad flexibility to explore new service offerings and business models, including differentiated arrangements with content providers that offer additional choices to consumers, rather than locking in place a one-size-fits-all approach. In the absence of demonstrable harm to competition, imposing ex ante regulation that restricts the ability of broadband providers to experiment and deploy such business models would distort market outcomes, reduce investment incentives, and thereby harm consumers. This is particularly true given the rapidly changing and dynamic nature of the industry, and the significant uncertainty concerning the services and business models that will best serve consumers going forward.

3. ***Competition in the provision of broadband services.*** There is significant competition among providers of broadband services. Broadband providers have made massive investments in deploying both wireline and wireless broadband networks, and the investments necessary to meet the growing consumer demand for broadband services are expected to continue. Both the wireline and wireless businesses have developed, and are continuing to develop, in a competitive manner without rigid regulations.

4. Competition between broadband providers creates incentives for providers to implement business models and practices that benefit consumers. And, the greater the degree of competition, the less likely that individual broadband providers would have the incentive or ability to engage in practices with regard to content providers that harm consumers, as

¹ Federal Communications Commission Notice of Proposed Rulemaking, In the Matter of Protecting and Promoting the Open Internet, May 15, 2014 at 4.

consumers can choose broadband networks that best suit their purposes in terms of price and quality attributes (including the speed and reliability of delivery of their desired content).²

5. *Wireline broadband services.* Most consumers have access to two or more wireline providers that offer broadband speeds of at least 3 Mbps (which the Commission generally considers to be “broadband” speeds), including from cable operators, telephone companies (DSL), and fiber providers such as Verizon and Google. In areas where wireline broadband services are available, 99 percent of U.S. households are in census tracts with access to at least two wireline providers that offer speeds of more than 3 Mbps. A large and growing share of the U.S. population also has access to broadband providers offering even higher speeds. In areas where wireline broadband services are available, 92 percent of U.S. households are in census tracts with access to two or more wireline broadband providers offering download speeds of at least 10 Mbps.

6. Many areas of the U.S. are served by both next-generation, high-speed cable modem services and all-fiber networks, like Verizon FiOS. Verizon’s all-fiber network will soon pass approximately 70 percent of the premises in its wireline footprint. In almost all areas where Verizon has deployed or is deploying its all-fiber network, it faces direct competition from cable operators. Thus, within Verizon’s wireline footprint, close to 70 percent of homes soon will have access to FiOS *and* high-speed cable services. Where all-fiber networks are available, there is significant competitive rivalry between broadband providers in terms of price and quality attributes, and consumers have access to competitive broadband services offering speeds of hundreds of megabits per second.

7. Other fiber-based deployments—such as “fiber-to-the-neighborhood” (“FTTN”, also referred to as “fiber-to-the-node”)—also are increasingly available and offer higher speeds than traditional DSL services. And, in areas where fiber is not yet available, most consumers also have access to DSL as well as cable. While the speeds and capabilities of DSL services are more limited than those of fiber or cable networks, DSL does offer a less expensive option for consumers who are more price-sensitive or do not require particularly high-speed broadband, and therefore can exert competitive discipline on cable providers.

² I approach my analysis and conclusions from the perspective of consumer welfare, and the viewpoint that promoting competition is fundamental to enhancing consumer welfare.

8. Competition has prompted providers to continue to make massive investments in deploying and upgrading next-generation broadband technology that offers consumers faster and faster broadband speeds. The introduction of fiber-based broadband services over fiber-to-the-home (or “FTTH”) networks starting around a decade ago ignited the race to make next-generation broadband services available to consumers. FTTH networks, while expensive to deploy, offer virtually unlimited capacity to meet consumer demand for higher speeds and lower latency. Verizon was the first to deploy FTTH on a wide scale, starting in 2004, investing around \$23 billion in its FiOS network. FiOS is the largest provider of FTTH in the United States, passing nearly 19 million households as of early 2014. Google has more recently begun to deploy FTTH in select cities, and is considering the possibility of expanding in many others. Other providers, such as AT&T’s U-Verse, have extended fiber closer to the home in order to achieve higher speeds than traditional DSL services (but not as high as FTTH).

9. Cable operators responded to the deployment of fiber networks by also offering very high-speed broadband services, including by rolling out DOCSIS 3.0 technology. Because this deployment only required upgrades to the cable operators’ existing plant, as compared to the relatively higher expense of constructing new fiber facilities, these services quickly became more widely available than fiber services. These next-generation cable modem services currently reach over 85 percent of the U.S. population. While next-generation cable services have greater capacity limitations than fiber networks, particularly for upstream speeds, these services offer high download speeds exceeding the demands of most of today’s consumers, with services currently available that offer download speeds of greater than 100 Mbps.

10. The competitive rivalry between wireline broadband access providers has led to falling (quality-adjusted) prices, higher broadband speeds, increased availability of high-speed broadband, greater consumer choice of products and packages, and other improvements in quality. There is no reason to believe that this competitive rivalry will diminish.

11. *Wireless broadband services.* There is vigorous competition among wireless providers. In this still nascent sector, wireless providers have made significant investments to deploy high-speed broadband services to consumers, including “fourth-generation” (“4G”) LTE technology, and to improve network coverage and capacity. Today, about 95 percent of consumers have access to broadband download speeds of greater than 10 Mbps over wireless networks.

Consumers can obtain wireless broadband from many providers, with almost 90 percent of the U.S. population having access to four or more wireless broadband carriers.

12. Wireless providers compete fiercely for customers on the basis of price, as well as with respect to important aspects of the wireless ecosystem, including the provision of valuable services, handset devices, operating systems, applications, and content. This competition among wireless providers has led to important consumer benefits. Mobile wireless speeds continue to rise, prices per megabyte of data continue to fall, and consumers have access to a wide and increasing variety of devices and plans. Even as the rollout of 4G LTE continues, the industry is already looking towards the next round of innovation and investment to further expand the capabilities of wireless broadband networks—innovations that could make wireless broadband more competitive with higher speed wireline services for more customers.

13. ***The changing competitive landscape.*** Industry developments in the past few years have transformed the competitive landscape. As a result of these industry developments, there are more substitutes for every part of the broadband network than traditional definitions would suggest.

14. ***The last mile.*** With regard to the last mile, the lines between traditional broadband network distinctions—wireline and wireless—have been blurring, and are expected to continue to blur. Consumers increasingly connect to wireline and wireless networks for many of the same uses, and increasingly substitute between wired and wireless devices and networks. These changes in broadband usage have been spurred by significant investments and other industry developments. First, significant improvements in speed and capacity of wireless networks have allowed consumers to perform many of the same tasks on wireless devices as they perform on computers connected via wireline networks. Although generally slower than wireline broadband options such as fiber and DOCSIS 3.0, 4G LTE network providers typically offer average download speeds of 5 to 12 Mbps that are sufficient for many uses, including streaming video, with the added benefit of mobility. While mobile broadband services today are unlikely to offer the same speeds and capabilities as next-generation wireline options like cable and fiber, wireless broadband is a rapidly-developing sector and wireless speeds have the potential to increase further with advancements in technology and the deployment of additional spectrum, both of

which require additional investments. Second, the advent of advanced wireless devices, particularly tablets, has blurred the distinction between wireless and wireline *devices*.

15. As a result, wireless broadband services already are, to some degree, a competitive alternative to wireline networks for some consumers, further increasing competitive pressures to meet consumer demands, and diminishing the incentive and ability of wireline broadband providers to adopt business practices disfavored by consumers. Wireless broadband has the potential to become an alternative to wireline broadband for more and more consumers, and for more uses, in the future if the rapid pace of technology improvements and innovation continue. However, wireless broadband is still a nascent industry that will require significant further investments, development, and innovation in order for this to happen. Accordingly, providing flexibility for wireless broadband providers to experiment with and implement different service offerings and business models is particularly important to enhancing the competitiveness of both the wireline and wireless industries.

16. *The Internet backbone.* With respect to the Internet backbone, content providers are using various ways to enable faster and more reliable content delivery. Networks and content providers are connecting directly more often, and in more places. The exchange of traffic over these connections is governed by an increasing variety of arrangements, such as “paid peering” where one party compensates another for connection and access to its network, and “quality of service” agreements that guarantee a certain level of transit quality by the network provider (*e.g.*, low latency or packet loss).

17. The exchange of traffic is also facilitated by firms other than broadband networks. For instance, content delivery networks (“CDNs”) sell services to content and application providers that improve the speed and quality at which their content can be accessed by users, generally by maintaining a large number of geographically-dispersed servers containing cached content that connect to the Internet near the location of customers. CDNs reduce the number of potential congestion points for delivering content from the providers’ data centers to end users. These ways of bypassing the backbone of the Internet and traditional forms of content delivery are becoming common. Many content providers use third party CDNs such as Akamai, Limelight, and Chinacache. Moreover, very large content providers such as Netflix, Google, and Amazon have developed their own proprietary CDNs.

18. To the extent that CDNs and various interconnection arrangements are substitutes to network management or differentiated arrangements for delivery over the last mile by broadband providers from the perspective of content providers (*e.g.*, for purposes of improving speed, latency, and reliability), these CDNs also may constrain the business practices of broadband providers. That is, even though CDNs manage traffic on different parts of the network, they may provide content providers an alternative means of increasing the speed, reducing latency, and/or improving reliability by which their content is delivered to users. This may constrain further the ability of broadband providers to engage in practices related to their last-mile facilities that could harm competition or consumers.

19. The development of CDNs and other innovative network arrangements also highlights the ability of the industry participants to adapt to the changing competitive landscape in creative and procompetitive ways, and to keep innovating in ways that create important consumer benefits. These developments have been achieved by relying on competitive market forces rather than through proscriptive or prescriptive regulation.

20. *The future outlook for broadband.* Despite the staggering investments by wireline and wireless broadband providers and the competitive successes of the broadband industry to date, there are significant opportunities and challenges ahead as broadband providers compete to bring innovative products and services to consumers. The rapid growth in demand for broadband of the past few years is expected to continue, if not accelerate. This growth in demand for broadband will largely be driven by increasing demand for certain content, particularly video, which is predicted to account for almost 70 percent of all Internet traffic in the next few years.

21. Similar trends are occurring in the wireless area, and these trends will create even greater challenges for wireless providers due to the significant capacity constraints they face, including as a result of the inherently limited amount of spectrum available. The launch of the iPhone in June 2007 and subsequent developments have led to an explosion in mobile broadband usage, as mobile Internet-connected devices proliferated. The rapid growth in consumer demand for wireless broadband is expected to continue, with more and more of this growth generated by specific types of applications such as video. In the next few years, the volume of mobile video traffic is expected to increase tenfold, and more than half of all mobile data traffic is projected to come from video usage.

22. Wireline and wireless broadband providers are expected to make significant infrastructure investments in the next few years to meet this growth in demand. But the biggest challenge is that the future of broadband use is highly uncertain. What content and applications will be offered, what consumers will demand, and the business models that will develop to meet consumer demands are largely unknown. The relatively short history of the Internet is filled with examples of firms introducing new business models that have changed how consumers use the Internet, and examples of leading companies that have gone by the wayside as technology and consumer tastes changed. The tremendous innovation that has occurred in the past few years is expected to continue, and future innovation may dwarf the advances of the past. This innovation will require experimentation with new services, business models, pricing structures, and network management practices.

23. ***Implications for the Commission's proposed rules.*** Given the level of competition in the broadband industry, and the nascent and rapidly changing broadband environment, the Commission should give broadband providers wide flexibility to experiment with novel service offerings and business models, including differential pricing and network management arrangements. Both the wireline and wireless industries have developed, and are continuing to develop, in a competitive manner. The current competitive environment, and massive historical and planned investments in deploying broadband networks to meet consumer demands, have been achieved by relying on competitive market forces, not through rigid regulation. Without heavy-handed regulation, the marketplace has shown considerable ability to meet the challenges brought on by changes in consumer demand and in the services offered by edge providers over broadband networks. There is no reason to believe that a considerable change in the regulatory approach is now necessary to ensure continued competitive rivalry, innovation, and investments.

24. Given the competitiveness of the wireline and wireless broadband industries, there is very limited risk that providers would adopt pricing and network management approaches that would harm competition and consumers. There is no evidence that broadband providers face insufficient competitive constraints, which is a necessary condition for firms to have the incentive and ability to enter into vertical business arrangements that harm competition and consumers. The risk of losing subscribers from inefficient practices is likely to provide a significant competitive constraint on broadband providers. And, if anything, competition between broadband providers is likely to intensify in the coming years.

25. While the risks of competitively harmful business practices are very limited, differential network management and pricing arrangements have the potential to generate significant benefits for competition and consumers. Two-sided pricing approaches provide one example of the types of arrangements that could generate important consumer benefits. Most directly, positive prices to content providers would tend to lower prices to consumers. The economics literature on “two-sided markets” shows that there is no economic basis that mandating “free” access to one side of the market (in the current context, content providers) is good for competition, consumer welfare, or innovation. Although, to date, the competitive equilibrium seems generally to be one where last-mile broadband providers have not directly entered into pricing arrangements with content and application providers (such as prioritization agreements), industry developments may make two-sided pricing arrangements beneficial.

26. As a result, there is little benefit and high risk of implementing regulation prohibiting certain pricing and network management strategies before demonstrating harm to competition and consumers that could arise from such practices. Restrictive ex-ante regulation would be especially inefficient because the broadband industry is rapidly changing and highly dynamic, and there is significant uncertainty regarding the future of the broadband industry. It is not possible to predict consumer demand, or the types of business models that undoubtedly will emerge. As a result, a one-size-fits-all approach is likely to deny consumers choices that they would otherwise find attractive.

27. In sum, there is no reason to believe that ex ante regulation that bans or restricts specific business models adopted by broadband providers would enhance competition and consumer welfare. In fact, imposing regulation that restricts the ability of providers to experiment with or adopt legitimate business arrangements would impose considerable costs, distort competition and market outcomes, and reduce investment incentives, all to the detriment of consumers. Imposing ex ante regulation on the *wireless* industry would pose an even greater threat to competition and consumer welfare. Rather than trying to impose a particular structure on service offerings or business models implemented by broadband providers, the Commission should adopt policies that give providers flexibility to experiment with and implement a wide range of approaches.

II. Competition between Wireline Broadband Providers

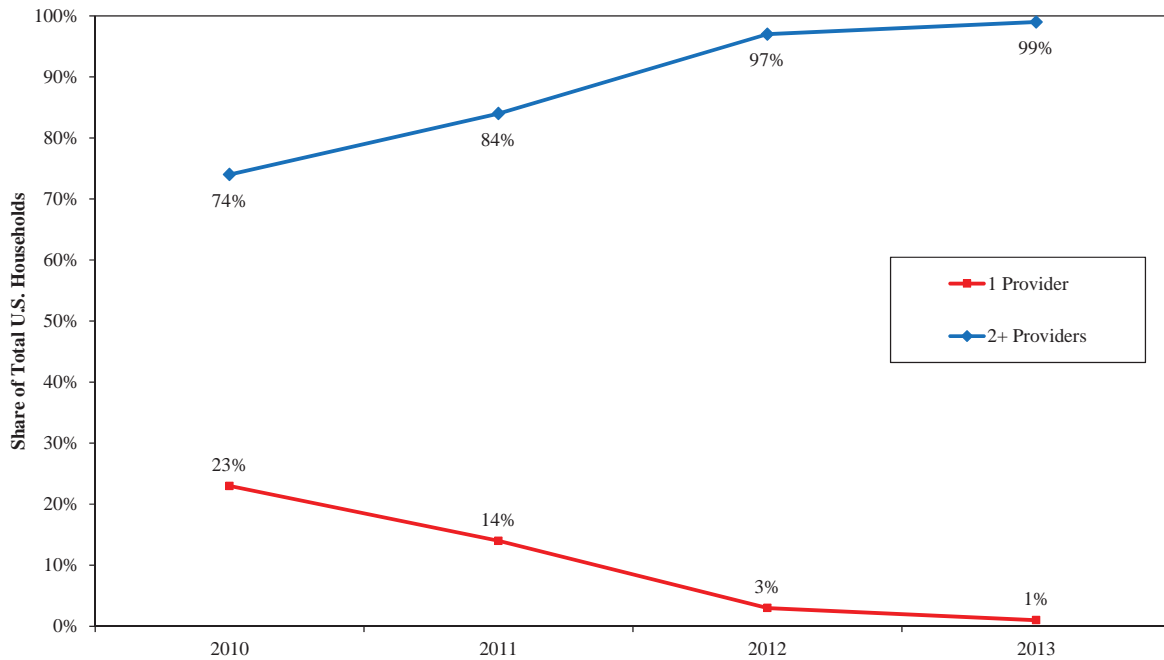
A. Most consumers have access to two or more wireline broadband providers

28. Most consumers have access to two or more wireline providers offering broadband with speeds of at least 3 Mbps, which the Commission generally considers to be “broadband” speeds.³ These broadband networks include the coaxial networks of cable operators, DSL offered by many telephone companies, and fiber networks offered by firms such as Verizon and Google. Data provided by the Commission shows that, in areas where wireline broadband services are available, 99 percent of U.S. households are in census tracts that have access to at least two wireline providers that offer speeds of more than 3 Mbps, compared to 74 percent in 2010, as shown in Figure 1 below.⁴

³ The Commission generally considers “broadband” download speeds to be those of at least 3 to 4 Mbps. (See, *e.g.*, Federal Communications Commission Industry Analysis and Technology Division, Wireline Competition Bureau, “Internet Access Services: Status as of December 31, 2012,” December 2013 at 4.) The Commission also has noted that 1.5 Mbps is a sufficient download speed for most consumers’ online activities, including email, playing video games, and streaming music, videos, or movies. The Commission notes that high-definition (HD) video streaming requires a minimum download speed of 4 Mbps. (Federal Communications Commission Broadband Speed Guide, available at <http://www.fcc.gov/guides/broadband-speed-guide>.)

⁴ Figures 1 and 2 are based on areas with at least one wireline broadband provider, which cover about 96.7 percent of the U.S. population. (Federal Communications Commission National Broadband Map, <http://www.broadbandmap.gov/summarize/nationwide>. Data as of June 30, 2013.) The data identifies providers operating anywhere in a given census tract, so it is possible that not every home in the census tract is passed by every provider operating in the area. Overall, 88 percent of the U.S. population has access to two or more wireline broadband providers, and 56 percent has access to three or more wireline broadband providers. (Federal Communications Commission National Broadband Map, <http://www.broadbandmap.gov/summarize/nationwide>. Data as of June 30, 2013.)

Figure 1: Share of U.S. Households with Wireline Broadband of at Least 3 Mbps

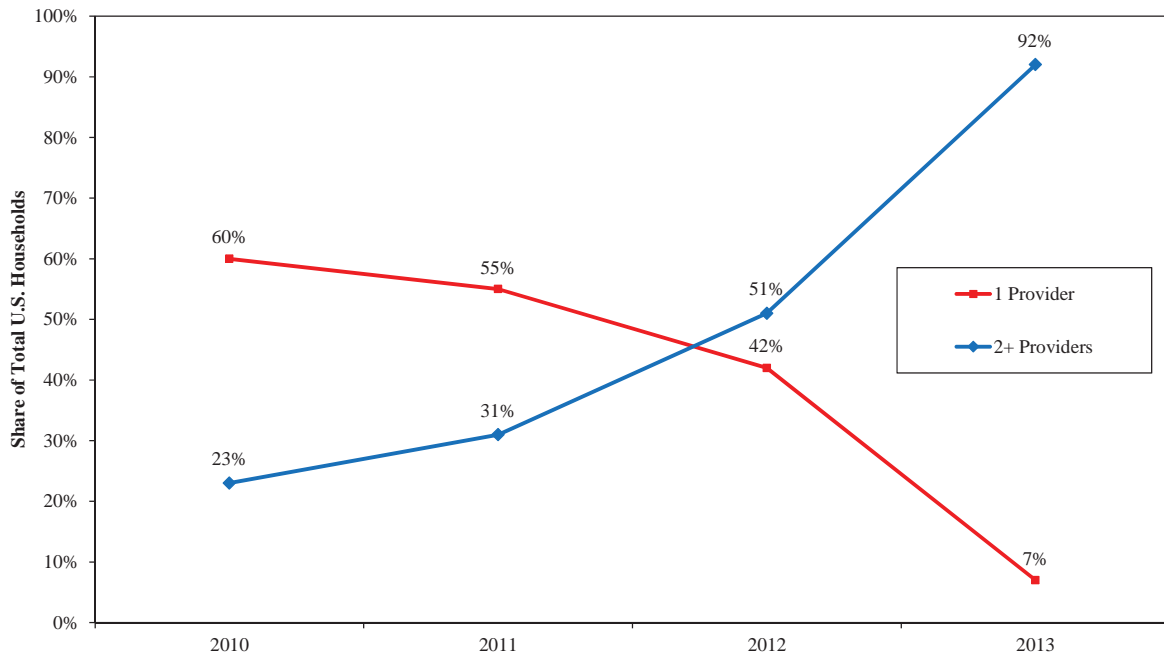


Notes: Shares reflect households in census tracts where providers report offering wireline broadband service at speeds of 3Mbps/786Kbps (download/upload) or higher. Data as of June of each year.
Sources: FCC Wireline Competition Bureau, Industry Analysis and Technology Division, "Internet Access Services" Reports, 2010 (March 2011), Figure 3(a); 2011 (June 2012), Figure 3(a); 2012 (May 2013), Figure 5(a); 2013 (June 2014), Figure 5(a).

29. A large share of the U.S. population has access to multiple broadband providers offering much higher speeds. In 2013, 92 percent of U.S. households in areas with some form of wireline broadband were in census tracts where two or more wireline broadband providers offered at least 10 Mbps download speeds, as shown in Figure 2 below, a considerable increase from 23 percent of households in 2010.⁵ As I discuss below, this rapid increase in the availability of high-speed broadband in the past few years was driven in large part by investments in deploying fiber networks and improving cable network technologies.

⁵ Federal Communications Commission Industry Analysis and Technology Division, Wireline Competition Bureau, "Internet Access Services: Status as of June 30, 2013," June 2014, Figure 5(a).

Figure 2: Share of U.S. Households with Wireline Broadband of at Least 10 Mbps



Note: Shares reflect households in census tracts where providers report offering wireline broadband service at speeds of 10Mbps/1.5Mbps (download/upload) or higher. Data as of June of each year.
Sources: FCC Wireline Competition Bureau, Industry Analysis and Technology Division, "Internet Access Services" Reports, 2010 (March 2011), Figure 3(a); 2011 (June 2012), Figure 3(a); 2012 (May 2013), Figure 5(a); 2013 (June 2014), Figure 5(a).

30. **Coaxial networks:** In most areas, cable providers were the initial providers of high-speed broadband, using networks of coaxial cable.⁶ Today, cable broadband Internet access is available to 88 percent of U.S. consumers.⁷ Cable broadband usage in the U.S. continues to expand, with subscriptions growing to more than 51 million, accounting for over 53 percent of total broadband subscribers.⁸

31. **DSL networks:** Local telephone companies have traditionally offered consumers broadband access over their copper phone wire networks, via a technology called digital

⁶ Most cable operators use hybrid fiber-coaxial ("HFC") networks, where fiber is used for transmission from major distribution stations to smaller neighborhood "nodes," and then coaxial cable runs from the nodes to subscribers' homes. (See, e.g., Timothy Brophy, Steven Condra, Martin Mattingly, Ron Hranac, & Leonard Ray, "FTTH Evolution of HFC Plants," Cisco, September 2011 at 3.)

⁷ Federal Communications Commission National Broadband Map, available at <http://www.broadbandmap.gov/summarize/nationwide>. Data as of June 30, 2013.

⁸ Strategy Analytics, "Service Provider Strategies (SPS), North America Broadband Forecast," 2014 at 3.

subscriber line (“DSL”). As of 2013, DSL was available to 89 percent of U.S. consumers.⁹ Some telephone companies have improved their DSL networks by deploying fiber in some parts of the network. For instance, AT&T’s U-verse uses fiber-to-the-neighborhood (“FTTN”, also referred to as “fiber-to-the-node”), and delivers broadband into homes over traditional copper wire DSL technology.¹⁰ The copper wiring to the home limits the speeds achievable by U-Verse and other FTTN networks, although extending fiber farther into the field increases speeds compared to traditional DSL services.

32. **Fiber networks:** Within the past decade, telecommunications firms such as Verizon have begun offering very high-speed broadband by deploying fiber-to-the-home (“FTTH”) broadband networks. Verizon FiOS, launched in 2004, was the first major FTTH undertaking in the U.S. It is reported that Verizon has invested roughly \$23 billion in building out the FiOS network.¹¹ As of March 2014, Verizon’s all-fiber network passed 18.9 million premises (and was available to over 15.5 million of those), with around 6.2 million broadband customers.¹² Verizon plans to have FiOS available to 70 percent of households in its wireline footprint.¹³ Verizon’s FiOS network currently offers broadband download speeds as high as 500 Mbps (up from 50 Mbps in 2007).¹⁴ By continuing expansion of its fiber network, and meeting consumer demands for high-speed broadband access, Verizon’s FiOS has steadily increased its penetration since launch (see Figure 3 below).¹⁵

⁹ Federal Communications Commission National Broadband Map, available at <http://www.broadbandmap.gov/summarize/nationwide>. Data as of June 30, 2013.

¹⁰ “How AT&T U-verse TV is Delivered,” ATT.com, available at https://www.att.com/Common/about_us/files/pdf/HowUverseIsDelivered_2-22.pdf.

¹¹ See, e.g., Malia Spencer, “Verizon plans more hires as it finalizes new FiOS tech center,” Pittsburgh Business Times, June 10, 2011, available at <http://www.bizjournals.com/pittsburgh/print-edition/2011/06/10/verizon-more-hires-new-fios-tech-center.html?page=all>.

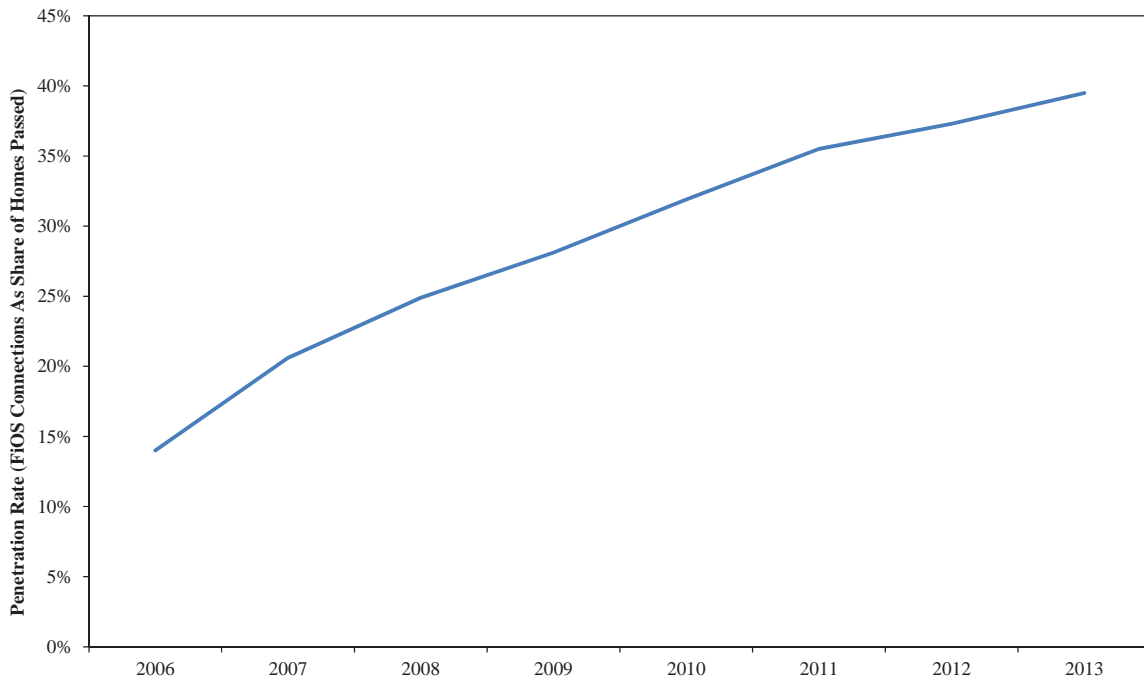
¹² “Verizon Communications Investor Quarterly 1Q 2014,” April 24, 2014 at 7; Verizon Communications 10-Q, April 29, 2014 at 31.

¹³ Thomson Reuters StreetEvents, “VZ - Verizon at Jefferies Global Technology, Media & Telecom Conference,” May 6, 2014 at 14, transcript available at http://www.verizon.com/investor/DocServlet?doc=jefferies_conf_vz_trans_2014.pdf.

¹⁴ See Figure 5 *infra*.

¹⁵ An analyst reported that two thirds of new FiOS subscribers were either new broadband subscribers, or previous cable subscribers. (Andrew Schmitt, “Strong Competitive Impact From Verizon’s FiOS Broadband,” Seeking Alpha, May 4, 2006, available at <http://seekingalpha.com/article/10074-strong-competitive-impact-from-verizons-fios-broadband-vz>.)

Figure 3: Verizon FiOS Penetration Rates



Sources: Verizon Communications 2006 10-K at 47; Verizon Communications 2007 10-K at 39; Verizon Communications 2008 10-K at 43; Verizon Communications 2009 10-K at 70; Verizon Communications 2010 10-K at 97; Verizon Communications 2011 10-K at 53; Verizon Communications 2012 10-K at 53; Verizon Communications 2013 10-K at 61.

33. More recently, other firms also have begun to deploy FTTH networks. For instance, Google Fiber offers gigabit speeds through its FTTH network. A recent industry report concluded that “Google’s aim is to build a competitive, profitable, fixed network covering a significant portion of US households.”¹⁶ Although Google Fiber is currently available only in Kansas City, Missouri, and Provo, Utah, Google is also building out its Google Fiber network in Austin, Texas and discussing the possibility of further expansion with 34 other U.S. cities and towns.¹⁷ In areas where it has been deployed, Google Fiber has successfully competed against cable providers.¹⁸ Other firms that have deployed FTTH networks in competition with cable

¹⁶ Jeff Baumgartner, “Google Fiber Capturing 75% Of Homes Passed In KC: Study,” Multichannel News, May 6, 2014, available at <http://www.multichannel.com/news/technology/google-fiber-capturing-75-homes-passed-kc-survey/374365>, discussing Carlos Kirjner and Peter Paskhaver, “Google Fiber: Scale Matters – How Large Could it Be? How Fast Could It Grow? Introducing Bernstein’s BIGH Model,” Bernstein Research, May 7, 2014.

¹⁷ Google Fiber expansion plans available at <https://fiber.google.com/newcities/>.

¹⁸ For instance, analysts estimate the penetration of Google Fiber in Kansas City and surrounding areas could increase to 65 percent in three to five years. (Alistair Barr, “Google Fiber Gets Snapped Up in Kansas City,” Wall Street Journal Digits, May 7, 2014, available at <http://blogs.wsj.com/digits/2014/05/07/google-fiber-gets-snapped-up-in-kansas-city/>.)

providers include HBC, PAXIO, and Smithville. There are also many smaller telephone companies that offer FTTH,¹⁹ and AT&T has plans to invest in FTTH in several metropolitan areas.²⁰ Currently, FTTH is available to about 12 percent of U.S. consumers.²¹

34. Overall, fiber broadband usage has continued to show significant growth. FTTH and FTTN are expected to increase from 17 million subscribers in 2013 to 27 million subscribers in 2019.²² By 2019, almost 25 percent of broadband subscribers are expected to have service from a fiber-based network, as shown in Figure 4 below. This increase in fiber subscribers includes gains vis-à-vis cable providers, as well as projected upgrades for consumers with traditional DSL networks to FTTN and FTTH.

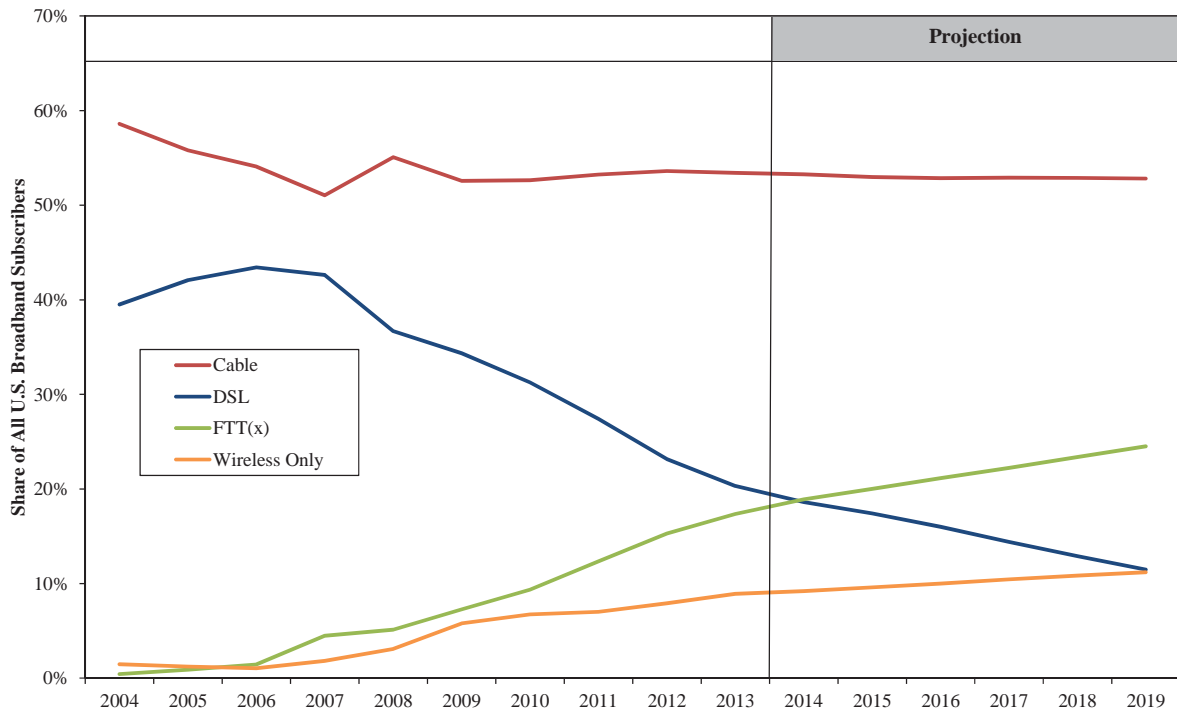
¹⁹ Telecommunications Industry Association, “TIA’s 2014-2017 ICT Market Review and Forecast,” 2014 at 3-27.

²⁰ Marguerite Reardon, “AT&T to Take Gigabit Broadband to 21 New Metro Areas,” CNET, April 21, 2014, available at <http://www.cnet.com/news/at-t-to-take-gigabit-broadband-to-21-new-metro-areas/>.

²¹ Federal Communications Commission National Broadband Map, available at <http://www.broadbandmap.gov/about-provider/verizon-communications-inc./nationwide/>. Data as of June 30, 2013.

²² Strategy Analytics, “Service Provider Strategies (SPS), North America Broadband Forecast,” April 2014 at 11. The data for FTT(x) include both FTTH providers (e.g., Verizon and Google Fiber) and other non-cable providers using fiber, such as AT&T (whose U-verse network uses FTTN).

Figure 4: U.S. Broadband Subscriber Shares by Technology



Notes: FTT(x) includes networks that use fiber in any part of the network. Markets with established and significant LAN or Powerline service subscriptions are included in the FTT(x) category. Wireless Only includes homes with primary access platform that is 3G/4G, fixed/mobile Wi-Max, or MMDS/LMDS satellite. Source: Strategy Analytics (SGS), "North American Broadband Forecast 2014," April 2014, tab USA.

B. Firm behavior is consistent with significant competition

35. **Price and quality competition:** There is significant competitive rivalry between wireline broadband providers in terms of price and quality attributes. Evidence of the strong competitive rivalry between cable and fiber can be observed from the deployment of fiber networks, particularly Verizon FiOS, and more recently by other firms such as Google. The deployment of fiber networks has incentivized cable operators to compete by lowering prices and improving quality. In areas where FiOS was first launched, cable incumbents responded by lowering prices.²³ An analyst report stated that “[t]he rollout of Verizon’s FiOS service in select markets

²³ For instance, when Verizon launched its FiOS fiber service in 2005 in Texas, incumbent cable provider Charter Communications reportedly dropped its prices shortly after. (Steve Titch, “Texas Gets Cable Competition, Lower Prices,” Heartland, May 1, 2006, available at <http://news.heartland.org/newspaper-article/2006/05/01/texas-gets-cable-competition-lower-prices>.) Later in 2008 as Verizon began to expand its FiOS system in New York, it was reported that cable rivals responded by “cutting prices on voice services and developing new technology that can match the data speeds of FiOS and cram in more TV channels.” (Saul Hansell, “Verizon FiOS: A Smart Bet or a Big Mistake?” The New York Times, August 18, 2008, available at <http://www.nytimes.com/2008/08/19/technology/19fios.html?pagewanted=all& r=0>.)

has elicited thinly advertised, yet highly competitive pricing responses for incumbent cable providers.”²⁴ A few years later, a 2010 article noted that FiOS “entry into an area leads to lower cable prices.”²⁵ A more recent example of this competitive rivalry occurred in late 2013, with Time Warner Cable cutting the price in half for its low-speed tier broadband offering and doubling the download speeds of both its low- and high-speed tiers in order to compete with Verizon FiOS.²⁶

36. Google’s recent deployment of fiber networks provides further evidence of this competitive rivalry, with cable providers attributing their competitive responses consisting of faster broadband speeds at lower prices to the deployment of Google Fiber. In Provo, Utah, where Google Fiber recently launched, Comcast reportedly “slashed” the price for a bundle of cable video and 105 Mbps broadband to \$120, the same price as Google’s high-speed broadband and Google TV package.²⁷ Additionally, Comcast reportedly offered a 250 Mbps speed service to compete with Google Fiber in Provo.²⁸ In Kansas City, the entry of Google’s Fiber in 2012 compelled Time Warner Cable to increase download speeds in all of its broadband service packages at no extra charge to consumers.²⁹ Analysts believe Google Fiber will “encourage current broadband network providers to get more aggressive with advanced rollouts.”³⁰

²⁴ Steve Titch, “Texas Gets Cable Competition, Lower Prices,” Heartland, May 1, 2006, available at <http://news.heartland.org/newspaper-article/2006/05/01/texas-gets-cable-competition-lower-prices>.

²⁵ Peter Svensson, “Verizon winds down expensive FiOS expansion,” Seattle Times, March 26, 2010, available at http://seattletimes.com/html/businesstechnology/2011449152_apustecverizonfios.html.

²⁶ “TW Cable Boosts Top Internet Speed,” Santa Monica Daily Press, October 28, 2013. See also, Deutsche Bank, “A Closer Look at FiOS,” April 1, 2014; Evercore Partners, “FiOS Market Level Analysis Points to Further Pressure for Cablevision,” September 15, 2013.

²⁷ “Comcast has slashed the pricing on its triple-play package in Provo, Utah, in advance of Google Fiber’s launch in the city later this year.” (Steve Donohue, “Report: Google Fiber threat prompts Comcast to slash prices in Provo,” FierceCable, August 15, 2013, available at <http://www.fiercecable.com/story/report-google-fiber-threat-prompts-comcast-slash-prices-provo/2013-08-15#ixzz35ZHxJD83>.) See also, “Google Fiber’s Impact on US Broadband,” Strategy Analytics, October 7, 2013.

²⁸ Jeff Baumgartner, “Google Fiber Kicks Off Provo Installs,” Multichannel News, November 13, 2013, available at <http://multichannel.com/news/content/google-fibers-kicks-provo-installs/356977>.

²⁹ Todd Spangler, “TWC Kicks Up Broadband Download Speeds,” Multichannel News, December 20, 2012, available at <http://multichannel.com/news/cable-operators/twc-kicks-broadband-download-speeds/326108>.

³⁰ Bank of America Merrill Lynch, “Google Inc., Speed Matters, Going Big on Fiber,” February 19, 2014 at 1.

37. Although DSL speeds are generally not comparable to speeds achieved over cable or fiber networks, DSL does offer a less expensive option for consumers who are more price-sensitive or do not require particularly high-speed broadband.

38. ***Investment and innovation competition:*** In dynamic, high-technology industries like the broadband industry, primary dimensions of competition are investment and innovation, as firms strive to create and offer better products and services to consumers. In the broadband industry, competition has prompted providers to continue to invest massive sums of money both in deploying next-generation broadband technology that offers consumers faster broadband speeds and in further upgrading and maintaining those networks to handle the rapidly growing volumes of traffic. In the past decade, the wireline broadband industry has invested hundreds of billions of dollars to offer consumers better-quality services—from 1996 to 2012, the U.S. wireline broadband industry invested approximately \$660 billion.³¹

39. Some broadband providers, particularly Verizon, have invested significant capital to deploy extensive broadband networks that achieve very fast broadband speeds by extending fiber to the home. It is reported that Verizon has invested roughly \$23 billion in building out the FiOS network.³² As mentioned, Verizon’s FiOS has become a strong competitor to cable operators in many areas of the country. FiOS will soon be available in 70 percent of Verizon’s wireline footprint.³³ In almost all areas where Verizon is deploying its all-fiber network, it faces direct competition from cable operators.

40. Google has built out its fiber network in two U.S. cities, is currently building out its network in another, and is considering the possibility of deploying all-fiber networks in many others. DSL providers have also been upgrading their legacy DSL infrastructure.³⁴ For example,

³¹ U.S. Telecom Research Brief, “Updated Capital Spending Data Show Rising Broadband Investment in Nation’s Information Infrastructure,” November 4, 2013 at 2.

³² See, e.g., Malia Spencer, “Verizon plans more hires as it finalizes new FiOS tech center,” Pittsburgh Business Times, June 10, 2011, available at <http://www.bizjournals.com/pittsburgh/print-edition/2011/06/10/verizon-more-hires-new-fios-tech-center.html?page=all>.

³³ Thomson Reuters StreetEvents, “VZ - Verizon at Jefferies Global Technology, Media & Telecom Conference,” May 6, 2014 at 14, transcript available at http://www.verizon.com/investor/DocServlet?doc=jefferies_conf_vz_trans_2014.pdf.

³⁴ SNL Kagan, “Media Trends Actionable Metrics, Benchmarks & Projections For Major Media Sectors,” December 2013 at 105.

as described above, AT&T's U-verse employs a combination of fiber (to the node) and copper wire (to the subscriber's home), and has announced plans to deploy its 1 Gbps high-speed "GigaPower" all-fiber (FTTH) broadband network in a number of locations.³⁵

41. These investments in fiber networks have spurred competition to deploy faster and faster broadband, and have compelled cable companies to upgrade their own networks in order to provide high-speed broadband services.³⁶ The cable providers responded to Verizon's deployment of FiOS by deploying DOCSIS 3.0 technology. As a *Wall Street Journal* article reported in 2008, analysts believed DOCSIS 3.0 "will allow the cable industry to compete on a more even footing with telecom giant Verizon Communications Inc., which is aggressively marketing a high-performance fiber-optic network called FiOS that offers much faster Internet connection speeds than cable modems can currently deliver."³⁷

42. Cable firms have continued to roll out DOCSIS 3.0 over the past five years, and this high-speed broadband technology is now available to more than 85 percent of households in the U.S.³⁸ This upgraded infrastructure will also facilitate increasing broadband speeds in the future (so-called "DOCSIS 3.1"), with speeds closer to 1 Gbps.³⁹ Cable companies also have begun deploying FTTH in some areas in order to compete with FiOS.⁴⁰

³⁵ Marguerite Reardon, "AT&T to Take Gigabit Broadband to 21 New Metro Areas," CNET, April 21, 2014, available at <http://www.cnet.com/news/at-t-to-take-gigabit-broadband-to-21-new-metro-areas/>.

³⁶ An industry analyst recently noted that "Verizon FiOS and AT&T U-Verse have already started pushing up speeds in other areas to create more pressure on the cable operators. Cable operators are responding, or in some cases leading, by deploying DOCSIS 3.0 solutions with 100Mbps and greater speeds." (Strategy Analytics, "Google Fiber's Impact on US Broadband," October 7, 2013.)

³⁷ Vishesh Kumar, "Cable Prepares an Answer to FiOS," *The Wall Street Journal*, February 14, 2008, available at <http://online.wsj.com/news/articles/SB120295689385867313>.

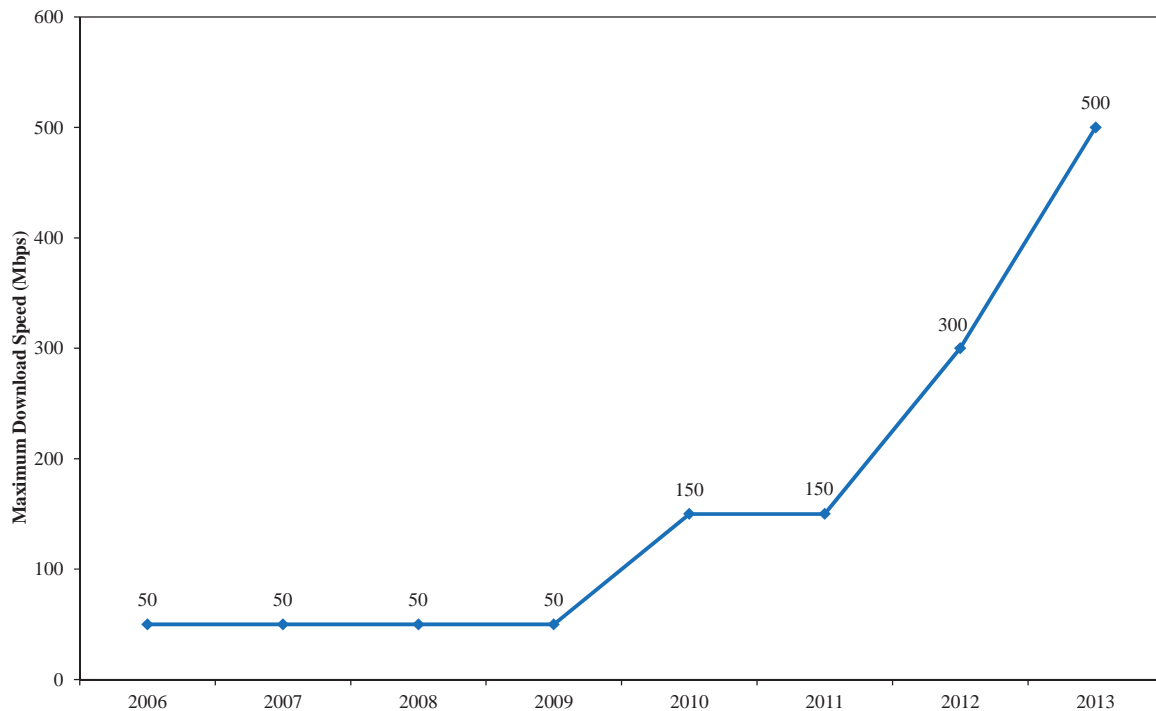
³⁸ National Cable & Telecommunications Association Industry Data, available at <https://www.ncta.com/industry-data>.

³⁹ Jeff Baumgartner, "DOCSIS 3.1 Speeds Ahead," *Multichannel News*, April 28, 2014, available at <http://www.multichannel.com/news/news-articles/docsis-31-speeds-ahead/374179>. See also, Telecommunications Industry Association, "TIA's 2014-2017 ICT Market Review and Forecast," 2014 at 3-25: "The rollout of DOCSIS 3.0 with channel bonding has increased maximum possible speeds, and the DOCSIS 3.1 specification, expected to be adopted in 2014, will enable speeds of up to 10 Gbps downstream and 1 Gbps upstream without the need to run FTTH."

⁴⁰ For instance, in September 2013, two months after FiOS began offering a 500 Mbps connection in the same areas, Comcast offered an Internet plan with a top download speed of 505 Mbps using FTTH. Comcast's fiber offering was available in select cities in the northeast U.S., including Washington, D.C., Philadelphia, Boston, Hartford, Baltimore and Richmond. ("Comcast Fights Fiber with Fiber," *Multichannel News*, September 23, 2013.) See also,

43. In turn, Verizon has continued to make investment in innovations to increase the speeds of its broadband offerings. Maximum download speeds for Verizon FiOS have increased by a factor of 10 since 2006, as shown in Figure 5 below, with most of those increases since 2011. These enhancements were achieved through technological investments, including the launch of FiOS “Quantum” service in 2012, which increased available maximum download speeds to 300 Mbps,⁴¹ and upgraded to 500 Mbps in 2013.⁴²

Figure 5: Verizon FiOS Maximum Download Speeds



Sources: Verizon Communications 2006 Annual Report at 4; Verizon Communications 2007 Annual Report at 13; Verizon Communications 2008 10-K at 11; Verizon Communications 2009 10-K at 13; Verizon Communications 2010 10-K at 10; Verizon Communications 2011 10-K at 8; Verizon Communications 2012 10-K at 8; Verizon Communications 2013 10-K at 8.

44. The Commission has recognized the significant role of competition in creating incentives to invest, and the benefits to consumers that this investment has generated. In its National

“Comcast Launches ‘Extreme 505’ Internet Tier in Chicago area,” Comcast Greater Chicago Region, May 30, 2014, available at <http://comcastgcr.com/2014/05/30/comcast-launches-extreme-505-internet-tier-in-chicago-area/>.

⁴¹ Emily Price, “Verizon Launches New FiOS Quantum Service, Offers Speeds Up To 300 Mbps,” Mashable, June 17, 2012, available at <http://mashable.com/2012/06/17/verizon-fios-quantum/>.

⁴² Chris Welch, “Verizon rolls out fastest FiOS tier yet with 500Mbps downloads, 100Mbps uploads,” The Verge, July 22, 2013, available at <http://www.theverge.com/2013/7/22/4546286/verizon-rolls-out-fastest-fios-quantum-tier-500-100>.

Broadband Plan, the Commission noted that “[d]ue in large part to private investment and market-driven innovation, broadband in America has improved considerably in the last decade. More Americans are online at faster speeds than ever before.”⁴³ Similarly, a recent White House report on broadband stated:

Responding to the increasing consumer demand for services accessed through broadband, the private sector has been driving important advances in infrastructure and technology. U.S. telecommunications firms have made significant investments in infrastructure; for example, just two of the largest U.S. telecommunications companies account for greater combined stateside investment than the top five oil/gas companies, and nearly four times more than the big three auto companies combined. In fact, since President Obama took office in early 2009, nearly \$250 billion in private capital has been invested in U.S. wired and wireless broadband networks. In just the last two years, more high-speed fiber cables have been laid in the United States than in any similar period since 2000.⁴⁴

C. Consumer behavior is consistent with significant competition

45. The behavior of consumers also is consistent with the existence of significant competitive rivalry among broadband providers, and that is particularly the case in areas where two or more wireline networks are available that are capable of supporting high broadband speeds, such as cable and fiber. In competitive industries, consumers generally evaluate competitive options, and choose the best provider for their needs. When better-quality and/or lower-price products or services become available (or when consumers become aware of the availability of such products and services), consumers in competitive markets are likely to switch providers. Generally, customer switching between competing suppliers is evidence that consumers have viable competitive alternatives.⁴⁵

46. There is significant customer switching in the broadband industry, particularly in recent years. This increase in consumer switching likely reflects the intensifying competition between broadband providers, driven by the deployment of fiber networks, and the upgrading of broadband networks by cable providers. For instance, a 2010 Commission study found that 36

⁴³ Federal Communications Commission, National Broadband Plan, March 17, 2010 at 3.

⁴⁴ The White House Office of Science and Technology Policy and the National Economic Council, “Four Years of Broadband Growth,” June 2013 at 4-5.

⁴⁵ However, the absence of switching does not necessarily imply an absence of competition. For instance, low propensity to switch may be the result of customer loyalty or long-term contracts, which may be the result of competition between firms rather than reflect the absence of competition.

percent of Internet users had switched broadband service providers in the prior three years.⁴⁶ Of those users that switched providers for reasons other than moving, 54 percent stated that getting a better price was a “major reason” to switch, and 55 percent said a major reason for switching was to get higher broadband speeds.⁴⁷ A 2011 U.S. government study of Internet use by U.S. consumers found that when consumers switched broadband providers, 38 percent did so because of price, 30 percent to obtain faster broadband speeds, 10 percent because of reliability, and 7 percent because of customer service.⁴⁸

47. Switching between providers in response to competitive offerings is enhanced by the fact that broadband consumers tend to be well informed. In the broadband industry, marketing and advertising raise consumer awareness of broadband services, and allow consumers to compare competitive offerings.⁴⁹ Industry groups and publications (*e.g.*, Consumer Reports, J.D. Power and Associates) provide surveys and comparisons of broadband provider offerings, and report user satisfaction with various providers, allowing consumers to make informed decisions when choosing providers.⁵⁰

48. Information to consumers also is provided by content providers themselves. Some content providers report the speed ratings of Internet service providers for delivery of the provider’s content. For instance, Google launched a speed test tool for YouTube videos called Google Video Quality Report, allowing users to compare YouTube video streaming speeds by

⁴⁶ Federal Communications Commission, “Broadband Decisions: What Drives Consumers to Switch – or Stick With – Their Broadband Internet Provider,” December 2010 at 2-3, available at <http://www.fcc.gov/encyclopedia/broadband-speed>.

⁴⁷ Federal Communications Commission, “Broadband Decisions: What Drives Consumers to Switch – or Stick With – Their Broadband Internet Provider,” December 2010 at 9, available at <http://www.fcc.gov/encyclopedia/broadband-speed>.

⁴⁸ National Telecommunications and Information Administration and Economics and Statistics Administration, “Exploring the Digital Nation: America’s Emerging Online Experience,” June 2013 at 23.

⁴⁹ For example, Comcast maintains a website entitled “XFINITY vs. the Competition” that compares its broadband and Wi-Fi services to those of other providers. (“XFINITY from Comcast vs. Verizon FiOS,” available at <http://www.comcast.com/compare/fios.html>.) AT&T maintains a similar site. (“Compare AT&T U-verse to Comcast,” available at <http://compareuverse.att.com/LandingPage.html#!/zipcode/60515/provider/Comcast>.)

⁵⁰ See, *e.g.*, “J.D. Power 2013 U.S. Residential Television Service Provider Satisfaction Study,” September 26, 2013, available at <http://www.jdpower.com/press-releases/2013-us-residential-television-service-provider-satisfaction-study>; Consumer Reports, “Save a bundle - How to piece together a great deal for TV, phone, and Internet service,” February 2010, available at <http://www.consumerreports.org/cro/magazine-archive/2010/february/electronics-and-computers/bundling/overview/bundling-ov.htm>.

their service provider versus the speeds of other service providers.⁵¹ A variety of web sites, as well as many broadband providers themselves (including Verizon, Charter, and Comcast), offer Internet speed test tools that allow users to test the speed of their broadband connection.⁵² This information allows consumers to evaluate and choose the best supplier for their needs.

49. To the extent that concerns exist regarding differential treatment of content provider traffic by broadband providers, such behavior could be monitored by consumers. In fact, the content providers themselves would have an incentive to inform consumers.⁵³ And, the Commission's own transparency rules will further ensure that the information necessary to evaluate the performance of broadband providers is available to consumers.⁵⁴

D. Consumer benefits from broadband competition

50. The competitive rivalry between wireline broadband access providers has led to falling prices, higher broadband speeds, increased availability of high-speed broadband, greater consumer choice of products and packages, and other improvements in quality.

51. ***Lower quality-adjusted prices:*** U.S. consumer prices for wireline broadband have decreased considerably over time. The decline in broadband prices is much more pronounced

⁵¹ Google Video Quality Report, available at <http://www.google.com/get/videoqualityreport/>; Angela Moscaritolo, "Test Your ISP's Video Quality With YouTube Tool," PCMag, May 29, 2014, available at <http://www.pcmag.com/article2/0,2817,2458723,00.asp>. The article states that "[p]roviders will receive a top-notch 'HD Verified' rating if they can 'consistently deliver HD video, a resolution of at least 720p, without buffering or interruptions,'" and notes that FiOS is an HD-verified provider.

⁵² See, e.g., CNET, Bandwidth Meter Speed Test, available at <http://www.cnet.com/internet-speed-test/>; Charter Communications Speed Test, available at <http://speedtest.charter.com/>; Verizon Speed Test, available at http://my.verizon.com/services/speedtest/?CMP=DMC-CVZ_ZZ_ZZ_Z_ZZ_N_Z00139.

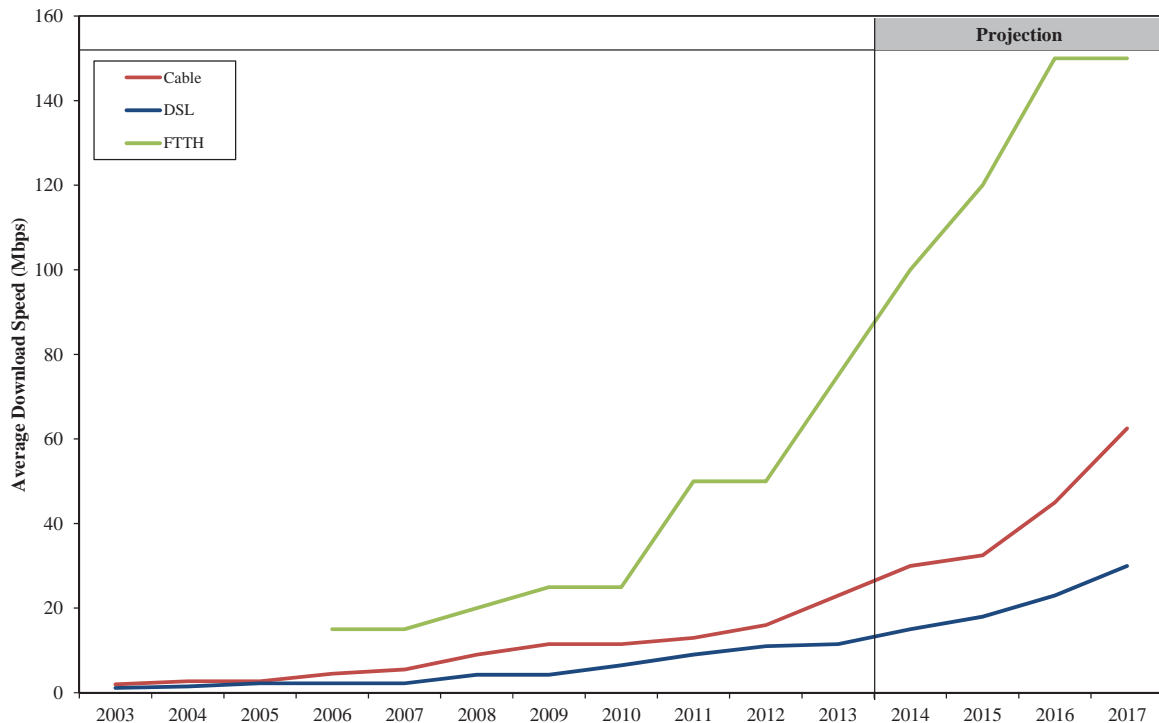
⁵³ This type of information dissemination has been observed in programming disputes between content providers and MVPDs. For instance, in August 2013, Time Warner Cable and CBS entered a dispute over carriage fees for CBS networks, as well as premium cable networks like Showtime, which resulted in a blackout of the channels for Time Warner Cable subscribers in major metropolitan areas including New York, Los Angeles, Boston and Chicago. Both Time Warner Cable and CBS released public statements and made posts via corporate sites and social media during the month-long battle attacking the other. (Sarah Barry James, "Time Warner Cable-CBS Blackout Begins," SNL Kagan, August 2, 2013 available at <http://www.snk.com/InteractiveX/article.aspx?TabStates=0&id=18870079&KPLT=2>.) CBS encouraged Time Warner Cable subscribers to switch to other providers such as Verizon FiOS or DIRECTV in order to view CBS programming. (David Lieberman, "No Deal! CBS and Showtime Go Dark On Time Warner Cable," Deadline Hollywood, August 2, 2013, available at <http://www.deadline.com/2013/08/no-deal-cbs-goes-dark-on-time-warner-cable/>.)

⁵⁴ Federal Communications Commission, Report and Order, Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191, December 23, 2010 (hereinafter, *Open Internet Order*), ¶¶ 53-61.

after accounting for increasing quality, such as higher speeds. In particular, consumer bandwidth costs have declined an average of 27 percent annually over the period 1999 to 2013, falling from \$1,245 per Gbps in 1999 to \$16 per Gbps in 2013.⁵⁵

52. **Higher broadband speeds:** U.S. broadband speeds have increased for virtually all locations and users. From 2006 to 2013, the *average* speed (across all wireline providers) offered on “standard packages” increased by at least 400 percent for every broadband technology (FTTH, cable, DSL), as shown in Figure 6 below.⁵⁶ As mentioned, some providers offer much higher *maximum* speeds—Verizon’s FiOS network currently offers broadband download speeds as high as 500 Mbps (up from 50 Mbps in 2007).

Figure 6: Average Wireline Broadband Speeds by Technology



Notes: Based on Standard Package offered by providers. Cable and DSL speeds are the average of the Top and Bottom speeds listed in the data. DSL includes AT&T U-verse.

Source: SNL Kagan 2013, "Media Trends: Actionable Metrics, Benchmarks & Projections For Major Media Sectors," July 2013 at 108, 110.

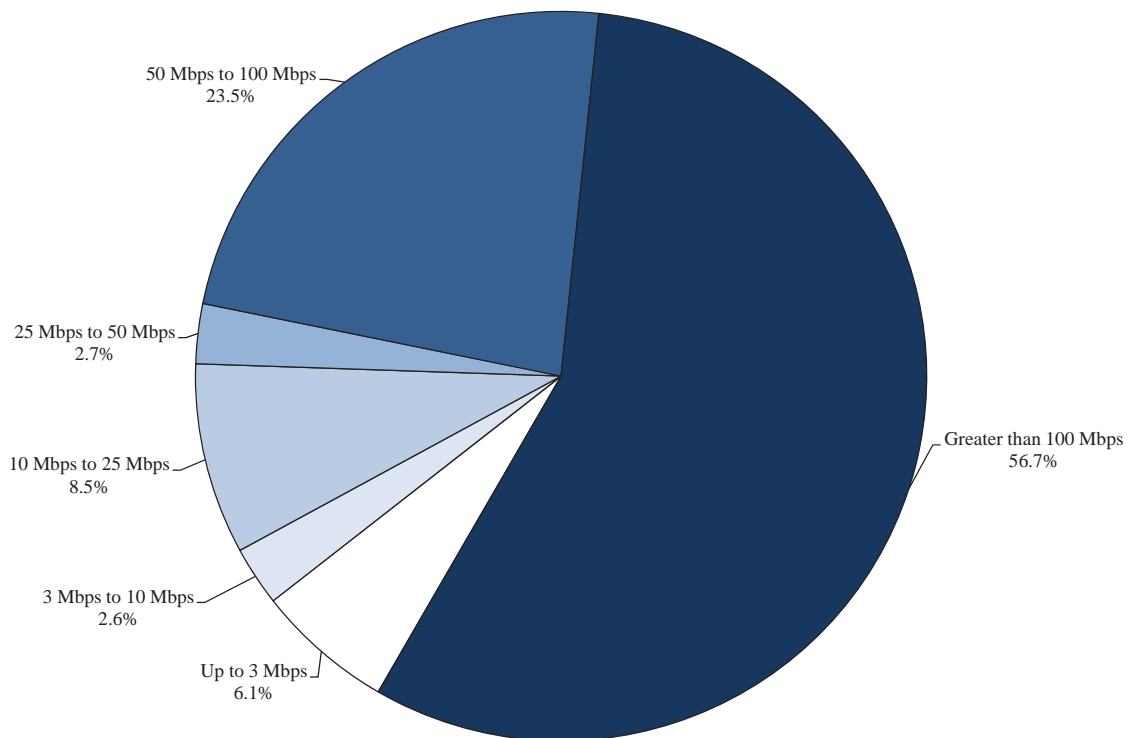
⁵⁵ Mary Meeker, “Internet Trends 2014 – Code Conference,” KPCB, May 28, 2014 at 72.

⁵⁶ SNL Kagan, “Media Trends: Actionable Metrics, Benchmarks & Projections for Major Media Sectors,” December 2013 at 108, 110. The Commission recently reported that, for all broadband technologies, “average subscribed speed is now 21.2 Mbps, representing an average annualized speed increase of about 36 percent.” (Federal Communications Commission Office of Engineering and Technology and Consumer and Governmental Affairs Bureau, “2014 Measuring Broadband America Fixed Broadband Report,” June 2014 at 13.)

53. Looking ahead, SNL Kagan forecasts that maximum download wireline broadband speeds in the U.S. will continue to increase over the next several years.⁵⁷ Cisco recently predicted that average wireline broadband speeds will more than double by 2018.⁵⁸

54. **Broader availability of high-speed broadband:** As a result of the historical and ongoing investments by broadband providers, most consumers in the U.S. now have access to high speed broadband services. Over 50 percent of consumers have access to broadband download speeds of at least 100 Mbps, roughly 80 percent have access to speeds of over 50 Mbps, and over 90 percent have access to speeds over 10 Mbps (see Figure 7 below).

Figure 7: Share of U.S. Consumers by Available Wireline Broadband Download Speeds



Note: Data as of June 30, 2013.

Source: FCC National Broadband Map, available at <http://www.broadbandmap.gov/summarize/nationwide>.

⁵⁷ SNL Kagan, “Media Trends: Actionable Metrics, Benchmarks & Projections for Major Media Sectors,” December 2013 at 108, 110.

⁵⁸ “Cisco VNI Forecast Highlights,” Cisco, available at http://www.cisco.com/web/solutions/sp/vni/vni_forecast_highlights/index.html.

55. **Greater consumer choice of packages and services:** Broadband providers offer a wide array of subscription plan choices to consumers, allowing users to pay for broadband access plans with the particular performance characteristics they demand. For example, Verizon offers FiOS plans with download speeds ranging from 15 to 500 Mbps. Comcast offers multiple high-speed data plans to its users, generally with speeds ranging from 3 Mbps to 105 Mbps.⁵⁹

56. Broadband providers are also offering subscribers enhanced services, such as control of their home TV via smartphone and tablet applications. For instance, Verizon offers a My FiOS application, which not only allows users to use their tablet or smartphone as a remote control, but also allows for remote setting of their DVR and management of their Verizon account to pay bills, listen to voicemail, review call logs and get technical support.⁶⁰ Comcast's Xfinity has a mobile app that allows users to change channels on their TV, schedule DVR programming remotely, search program listings, and watch on demand shows.⁶¹

E. The increasing role of interconnection arrangements and content delivery networks (CDNs)

57. Content providers are using various ways to bypass the Internet "backbone," and interconnection points between various networks and sources of Internet traffic, in order to enable faster and more reliable content delivery. Networks and content providers are connecting directly more often, and in more places.⁶² The exchange of traffic over these connections is governed by an increasing variety of arrangements, such as "paid peering" (where one party compensates another for connection and access to its network)⁶³ and "quality of service"

⁵⁹ SNL Kagan, "HSD Pricing by Provider," 2013. Comcast also offers an Internet plan with a top download speed of 505 Mbps in a handful of markets. ("Comcast Fights Fiber with Fiber," Multichannel News, September 23, 2013.)

⁶⁰ Verizon My FiOS, available at <https://www.verizon.com/fiostv/myapps/unprotected/apps.aspx>.

⁶¹ The Xfinity TV Remote App, available at <http://xfinity.comcast.net/learn/internet/mobile-tv-app/>.

⁶² See, e.g., Bret Swanson, "How the Net Works: A Brief History of Internet Interconnection," Entropy Economics, February 21, 2014 at 2.

⁶³ Internet backbone providers always have "paid" each other for the exchange of traffic. While, historically, "settlement free peering" existed, these arrangements occurred between networks with roughly equal traffic flows across exchange points, such that traffic was the "currency" used by the parties. Like other bartering arrangements, if the exchange became "asymmetric" (*i.e.*, when one network began to deliver substantially more traffic than the other), "paid peering" arrangements are used to compensate the party receiving more traffic. (Bret Swanson, "How the Net Works: A Brief History of Internet Interconnection," Entropy Economics, February 21, 2014 at 2.)

agreements (which guarantee a certain level of transit quality by the network provider, such as low latency or packet loss).

58. The exchange of traffic is increasingly facilitated by firms other than content providers or broadband networks. CDNs, for example, sell services to content and application providers that improve the speed and quality at which their content can be accessed by users. CDNs reduce the number of potential congestion points for delivering content from providers' data centers to end users.⁶⁴ For instance, content providers pay CDNs to cache frequently requested web content at many locations throughout the Internet to enable faster content delivery and lower latency. Many content providers use third party CDNs such as Akamai, Limelight, and Chinacache. Moreover, very large content providers such as Netflix, Google, and Amazon have developed their own proprietary CDNs.⁶⁵

59. These ways of increasing the efficiency of delivering products and services over the Internet are becoming more and more common. For instance, CDNs are projected to carry over half of all Internet traffic by 2018.⁶⁶ With regard to online video, 67 percent of traffic is projected to be delivered by CDNs by 2018, up from 53 percent in 2013.⁶⁷ Video traffic is forecast to be the primary driver of growth in CDN revenue in coming years, accounting for 81 percent of total CDN revenue by 2017.⁶⁸

60. CDNs, along with other interconnection arrangements, play an important role in facilitating the efforts of content providers of all types and sizes to more effectively reach

⁶⁴ See, e.g., Cisco, "Internet Video: New Revenue Opportunity for Telecommunications and Cable Providers," July 2010. CDNs have been around since the mid-1990s, but their business models have evolved as the broadband industry has changed. In addition to providing content caching, some CDNs may license their services to other network operators. "Retail" CDNs specialize in "managed content" (IPTV and VOD), while other CDNs offer support for over-the-top (OTT) content streaming and multi-device access (e.g., TV Everywhere). CDNs also provide "value-added" services such as website and application acceleration, online security, and digital publishing. (informa, "Content Delivery Networks: Market dynamics and growth perspectives," 2012 at 4.)

⁶⁵ See, e.g., Anna-Maria Kovacs, "Telecommunications competition: the infrastructure-investment race," Internet Innovation Alliance, October 8, 2013 at 7; Jon Brodtkin, "Netflix's many-pronged plan to eliminate video playback problems," Arstechnica, May 13, 2014, available at <http://arstechnica.com/information-technology/2014/05/netflixs-many-pronged-plan-to-eliminate-video-playback-problems/>.

⁶⁶ Cisco, "Cisco Visual Networking Index: Forecast and Methodology, 2013–2018," June 10, 2014 at 2.

⁶⁷ Cisco, "Cisco Visual Networking Index: Forecast and Methodology, 2013–2018," June 10, 2014 at 2.

⁶⁸ informa, "Content Delivery Networks: Market dynamics and growth perspectives," 2012 at 4.

users.⁶⁹ Third-party CDNs allow content providers that do not have significant scale to improve the speed and quality at which their content can be accessed by users, in competition with larger providers that have the scale to invest in their own proprietary CDNs. Thus, third-party CDNs “level the playing field” between large and small content providers in terms of ensuring the efficient delivery of their content to users. CDNs also may provide a competitive alternative to arrangements with broadband providers for both small and large content providers.

III. Competition between Wireless Broadband Providers

A. Consumers have many options of mobile broadband providers

61. There is vigorous competition in the wireless broadband industry. Consumers today can obtain wireless broadband from many providers, with almost 90 percent of the U.S. population having access to four or more wireless broadband carriers.⁷⁰

62. The majority of U.S. consumers also have access to high-speed 4G LTE services from multiple providers. As one industry analyst noted:

Now that Verizon’s LTE deployment covers about 300 million Americans, that number is closer to 95 percent. With AT&T’s LTE deployment reaching 270 million Americans by year-end-2013 and 300 million Americans by mid-2014, that number will be even higher, assuming the two networks do not overlap completely. And, of course, that means that at least 95 percent of Americans will have access to at least two competing mobile wireless broadband networks within a year. Once T-Mobile and Sprint complete their LTE buildout to the roughly 225 and 200 million Americans that they have, respectively, committed to cover, about 60 percent-70 percent of Americans will have access to between three and four LTE networks.⁷¹

63. Many U.S. consumers also have access to and use broadband technology that combines wireline and wireless elements. So-called “fixed wireless” broadband uses wireline to deliver broadband service close to homes, and then uses small wireless antennas to provide the final

⁶⁹ An analyst report about the CDN market noted that “CDNs could help smaller OTT players disrupt the content hierarchy.” (informa, “Content Delivery Networks: Market dynamics and growth perspectives,” 2012 at 7.)

⁷⁰ Federal Communications Commission National Broadband Map, available at <http://www.broadbandmap.gov/summarize/nationwide>. Data as of June 30, 2013.

⁷¹ Anna-Maria Kovacs, “Telecommunications competition: the infrastructure-investment race,” Internet Innovation Alliance, October 8, 2013 at 19.

connection to households. As the Commission has noted, “[f]ixed wireless technologies using longer range directional equipment can provide broadband service in remote or sparsely populated areas where other types of broadband would be too costly to provide.”⁷² The Commission also has noted that fixed wireless broadband is used by over two million subscribers in the U.S., mostly in rural areas.⁷³

B. Firm behavior is consistent with significant competition

64. *Price competition:* Wireless providers compete fiercely for customers on the basis of price, and with respect to other important aspects of the wireless ecosystem, including the provision of valuable services, handset devices, operating systems, applications, and content. Competitive responses to rivals by wireless providers include reducing prices, dropping long-term contractual requirements, paying off early-termination fees, and offering monthly installment plans for handset purchases.⁷⁴

65. Wireless broadband providers also have competed in recent years by providing diverse pricing options. For instance, during 2011, providers were experimenting with various models of usage-based pricing, with tiered pricing dependent on usage for each mobile device.⁷⁵ In the

⁷² Federal Communications Commission, “Getting Broadband,” available at <http://www.fcc.gov/guides/getting-broadband>.

⁷³ Federal Communications Commission National Broadband Plan at 37; Robert. C. Atkinson, Ivy E. Schultz, Travis Korte, and Timothy Krompinger, “Broadband in America – 2nd Edition, Where It Is and Where It Is Going, Update of the 2009 Report Originally Prepared for the Staff of the FCC’s Omnibus Broadband Initiative,” May 2011 at 71.

⁷⁴ Carriers’ actions in recent months exemplify the “tit-for-tat” competition that has characterized the wireless broadband industry. In December 2013, AT&T introduced a new mobile sharing plan that offered discounts of \$15 a month if subscribers were put on a Next plan (non-subsidized device). Then in January 2014 Sprint announced “Framily” (Friends and Family) plans that give subscribers discounts as they expand their “Framily.” The next month, AT&T added an additional \$10 per line discount to Next customers with at least a 10GB of data plan. At the same time Verizon launched its “More Everything” plans that gave its Edge (non-subsidized device) subscribers a \$10 per line discount on plans with less than 10GB of data and a \$20 per line discount on Edge plans above 10GB data. In March 2014, AT&T lowered the price of its 2GB plan for both its subsidized and Next subscribers, while T-Mobile increased the allotted data for some of its plans by 500MB, and added an additional 5 Gb data tier. In April 2014, Verizon implemented another \$5 discount per line on its 10GB plus Edge plan. In the same month Sprint launched an initiative where it would pay up to \$350 in early termination fees and \$300 for an old phone if a subscriber switched to Sprint and enrolled in a Family plan. (Bank of America Merrill Lynch, “1Q14: Preview & Model Book – Everybody’s Doing It,” April 14, 2014 at 5.)

⁷⁵ The Commission’s recent Mobile Wireless Competition Report describes that “three distinct models for smartphone data pricing emerged in 2011: (1) tiered, usage-based data pricing with overage charges (Verizon and AT&T); (2) tiered, usage-based data pricing with speed reductions instead of overage charges (T-Mobile); and (3) unlimited data pricing (Sprint).” (Federal Communications Commission, 16th Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, March

latter part of 2012, providers offered consumers more freedom in regards to total wireless data usage. Verizon and AT&T introduced “shared” data plans which allow consumers to “pool” their data use across multiple devices on one plan, T-Mobile reintroduced an unlimited data wireless plan option, and Sprint maintained its own unlimited data plan.⁷⁶

66. Many wireless service plans now allow subscribers the freedom to upgrade their devices whenever they want instead of waiting for the end of a two-year contract.⁷⁷ Recently, major wireless providers have begun to offer non-subsidized device plans, where the customer pays full price for the handset (either upfront or in interest free monthly installments) and then receives a discount on their monthly service charge.⁷⁸

67. **“Platform” competition:** Competition among wireless broadband providers takes place in an “ecosystem” that includes various complementary products and services, including wireless devices, operating systems, applications, and other services. In this environment, wireless broadband providers compete for customers by offering innovative broadband-connected mobile devices (which provide access to specific mobile platforms, such as iOS, Android, or Windows Mobile) and mobile services. Wireless carriers generally purchase handsets in bulk quantities from smartphone manufacturers, and then sell the devices to consumers at a discount in combination with a service plan.⁷⁹

68. The devices offered by wireless carriers, and the corresponding mobile platform accessed by the devices, have become important dimensions of competition for wireless carriers. The release of Apple’s iPhone (and the iOS platform) illustrates the importance of this competition.

21, 2013 (hereinafter “Federal Communications Commission, 16th Annual Mobile Wireless Competition Report”), at 98.)

⁷⁶ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 98. Providers also continued to offer low-priced, low-data usage plans for consumers with limited data needs, for instance. As the Commission notes, “to continue attracting new customers with limited data needs, Verizon kept two entry-level plans for new customers with basic phones.” (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 102-103.)

⁷⁷ Brad Molen, “Your Carrier Wants You To Buy Into Early Upgrades, But Should You Take the Bait?” Engadget, February 19, 2014, available at <http://www.engadget.com/2014/02/19/early-upgrade-plans/>.

⁷⁸ See, e.g., Mark Rogowsky, “Verizon Tweaks Its Plans Again: Customers Win, Contracts Lose,” Forbes, April 15, 2014, available at <http://www.forbes.com/sites/markrogowsky/2014/04/15/verizon-tweaks-its-plans-again-customers-win-contracts-lose/>.

⁷⁹ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 224.

When the iPhone was introduced in 2007 as an exclusive AT&T device, it was seen as the main driver behind AT&T's subscriber gains vis-à-vis other wireless carriers.⁸⁰ Some analysts estimated that AT&T paid more for the deal than it made back from its iPhone subscribers.⁸¹ To compete with AT&T, Verizon Wireless partnered with Google and heavily promoted Android-based phones made by Motorola and HTC. It was not until January 2011 that Verizon began carrying the iPhone.⁸² Verizon's share of the smartphone market increased 3.7 percentage points after the introduction of the iPhone on its network.⁸³ Sprint CEO Dan Hesse said Sprint's lack of iPhone carriage was the number one reason customers had been leaving Sprint.⁸⁴ Sprint began selling the iPhone in late 2011, and subsidized iPhone devices by as much as \$450 per device.⁸⁵ In March 2013, T-Mobile launched a series of initiatives in order to better compete, headlined by the mobile carrier finally offering the iPhone.⁸⁶

⁸⁰ Shayndi Raice and Yukari Iwantani Kane, "Verizon Finally Lands the iPhone," *The Wall Street Journal*, January 8, 2011, available at <http://online.wsj.com/news/articles/SB10001424052748704739504576068170230339348>; Peter Cohan, "Project Vogue: Inside Apple's iPhone Deal with AT&T," *Forbes*, September 10, 2013, available at <http://www.forbes.com/sites/petercohan/2013/09/10/project-vogue-inside-apples-iphone-deal-with-att/>.

⁸¹ According to analyst Gene Munster of Piper Jaffray, AT&T paid Apple an estimated \$18 per month per iPhone subscriber, which exceeds the actual price of the iPhone over the two-year life of a user contract. (Tom Krazit, "Piper Jaffray: AT&T paying Apple \$18 per iPhone, per month," *CNET*, October 24, 2007, available at <http://www.cnet.com/news/piper-jaffray-at-t-paying-apple-18-per-iphone-per-month/>.)

⁸² Shayndi Raice and Yukari Iwantani Kane, "Verizon Finally Lands the iPhone," *The Wall Street Journal*, January 8, 2011, available at <http://online.wsj.com/news/articles/SB10001424052748704739504576068170230339348>.

⁸³ Verizon had a 26.7 percent share of U.S. smartphone subscribers before it began offering the iPhone (three month average ending December 2010), and a 30.4 percent share a year later (three month average ending December 2011). (comScore MobiLens data; comScore, "U.S. Digital Year in Review," February 2011 at 27, available at <http://www.cmpa.ca/sites/all/themes/cmpa/content/ind-publications/US-Digital-Year-in-Review-2010.pdf>; comScore, "2012 Mobile Future In Focus", February 2012 at 15, available at <http://www.iab.net/media/file/comScore%2B2012%2BMobile%2BFuture%2Bin%2BFocus.pdf>.)

⁸⁴ David Goldman, "The iPhone Is A Nightmare For Carriers," *CNNMoney.com*, February 8, 2012, available at http://money.cnn.com/2012/02/08/technology/iphone_carrier_subsidy/.

⁸⁵ Carriers such as Sprint pay Apple about \$650 per iPhone. The cost to consumers is typically around \$200, which implies a "subsidy" of around \$450 per device by the carrier. (Anton Troianovski and Don Clark, "Inside Nokia's Struggle Against Apple's iPhone," *The Wall Street Journal*, May 31, 2012, available at <http://online.wsj.com/news/articles/SB10001424052702303640104577436443119293310>; based on cost for an iPhone 4S 16-gigabyte device (see, Apple iPhone 4s (Sprint) Review (<http://www.pcmag.com/article2/0,2817,2394683,00.asp>); JoAnn S. Lublin and Spencer E. Ante, "Inside Sprint's Bet on iPhone," *The Wall Street Journal*, October 4, 2011, available at <http://online.wsj.com/news/articles/SB10001424052970203405504576603053795839250>. See also, David Goldman, "The iPhone Is A Nightmare For Carriers," *CNNMoney*, February 8, 2012, available at http://money.cnn.com/2012/02/08/technology/iphone_carrier_subsidy/.)

⁸⁶ Marguerite Reardon, "T-Mobile Finally Gets the iPhone," *CNET*, March 26, 2013, available at <http://www.cnet.com/news/t-mobile-finally-gets-the-iphone/>.

69. **Investment competition:** As with wireline networks, investments in upgrading wireless networks in order to offer customers better-quality wireless broadband services is an important competitive dimension. Wireless broadband providers have invested substantial amounts in their wireless network infrastructure in recent years, including to deploy high-speed broadband services to consumers and to improve the breadth of network coverage and capacity.⁸⁷ In particular, all major wireless carriers have rolled out so-called “fourth-generation” (“4G”) technology, which allows the provision of much higher data speeds over wireless broadband.⁸⁸

70. Verizon was the first and leading wireless provider to roll out 4G in the U.S., and is considered “the pioneer in LTE deployment.”⁸⁹ Verizon began deploying its 4G LTE network in late 2010, and aggressively expanded its 4G network coverage—by 2012 the majority of its data traffic was traveling on 4G.⁹⁰ AT&T, Sprint, and T-Mobile subsequently launched their 4G networks (in 2011, 2012, and 2013, respectively).⁹¹ Verizon currently offers 4G LTE in over 500 cities, covering over 97 percent of the U.S. population. AT&T offers 4G coverage to 88 percent, Sprint to 71 percent, and T-Mobile to 63 percent.⁹² According to a recent Mobility

⁸⁷ These investments include both cell sites and the backhaul connections between sites, which facilitate increased speed and capacity. (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 127.)

⁸⁸ “4G” includes a variety of technological specifications. The terms “3G” and “4G” are used by industry for marketing purposes, as well as by the International Telecommunications Union (ITU) for technical specifications. For example, T-Mobile, AT&T, and Verizon Wireless refer to their WiMAX, HSPA+, and LTE networks as “4G.” (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 123.)

⁸⁹ Marguerite Reardon, “T-Mobile launches 4G LTE network,” CNET, March 26, 2013, available at <http://www.cnet.com/news/t-mobile-launches-4g-lte-network/>.

⁹⁰ Marguerite Reardon, “Verizon: Our 4G LTE network will soon carry most of our data,” CNET, October 9, 2012, available at <http://www.cnet.com/news/verizon-our-4g-lte-network-will-soon-carry-most-of-our-data/>.

⁹¹ Phil Goldstein, “AT&T to launch LTE Sunday, September 18,” FierceWireless, September 15, 2011, available at <http://www.fiercewireless.com/story/att-launch-lte-sunday/2011-09-15>. Marguerite Reardon, “Sprint officially launches 4G LTE in 15 cities,” CNET, July 16, 2012, available at <http://www.cnet.com/news/sprint-officially-launches-4g-lte-in-15-cities/>; Marguerite Reardon, “T-Mobile launches 4G LTE network,” CNET, March 26, 2013, available at <http://www.cnet.com/news/t-mobile-launches-4g-lte-network/>.

⁹² Verizon Communications 2013 Annual Report at 10, available at <http://www.verizon.com/investor/annualreports.htm>; AT&T Inc. 2013 Annual Report at 5, available at <http://www.att.com/gen/investor-relations?pid=9186>; The Sprint Quarterly Investor Update, April 29, 2014 at 3, available at <http://investors.sprint.com/Cache/1001186417.PDF?Y=&O=PDF&D=&fid=1001186417&T=&iid=4057219>; T-Mobile 2013 Annual Report at 4-5, available at <http://investor.t-mobile.com/GenPage.aspx?IID=4091145&GKP=1073748984>; US Census Bureau Population Clock, December 31, 2013, available at <http://www.census.gov/popclock/>.

Report by Ericsson, by 2019, 85 percent of mobile subscriptions in North America will be LTE (a particular type of 4G technology).⁹³

71. Verizon recently began further upgrades of its 4G network. In particular, Verizon's 4G "XLTE" delivers faster peak data speeds, and double the bandwidth compared to "regular" 4G.⁹⁴ The technology is expected to improve performance on Verizon's wireless broadband network, especially in densely populated areas.⁹⁵ As of June 2014, the XLTE 4G network had been launched in over 300 of Verizon's 500 4G LTE-ready cities.⁹⁶

72. Investments by wireless providers in 4G and other wireless technology and infrastructure continue to be sizeable, and are only expected to increase. Since 2002, U.S. wireless providers have invested on average a combined \$22.6 billion per year to upgrade their networks.⁹⁷ More recently, annual investment in U.S. wireless networks grew from \$21 billion in 2009 to \$30 billion in 2012.⁹⁸ In 2011, wireless broadband providers Verizon and AT&T were the top two American firms in terms of capital expenditures.⁹⁹

C. Consumer behavior is consistent with significant competition

73. As with wireline broadband, consumers evaluate competing offers from multiple wireless broadband providers, and choose the optimal device and plan for their location, data needs, price

⁹³ Ericsson, "Ericsson Mobility Report On the Pulse of the Networked Society," June 2014 at 9, available at http://www.ericsson.com/news/1790097?categoryFilter=press-releases_1270673222_c.

⁹⁴ Debi Lewis, "XLTE: America's Best Network Gets Even Better," VerizonWireless, June 26, 2014 available at <http://www.verizonwireless.com/news/article/2014/05/verizon-wireless-xlte.html>. As of June 2014, Verizon was continuing its rollout of its XLTE network improvements. XLTE "delivers faster peak data speeds and a minimum of double the bandwidth to 4G LTE customers in high traffic areas in markets nationwide where Advanced Wireless Services (AWS) spectrum has been activated." The technology allows capable devices to access both 700 MHz and AWS spectrum, and thus also frees up bandwidth for non-XLTE ready devices on the 700 MHz spectrum.

⁹⁵ Angela Moscaritolo, "Verizon Brings Super-Charged XLTE to 300 Markets," PCMag, June 27, 2014, available at <http://www.pcmag.com/article2/0,2817,2460175,00.asp>.

⁹⁶ Angela Moscaritolo, "Verizon Brings Super-Charged XLTE to 300 Markets," PCMag, June 27, 2014, available at <http://www.pcmag.com/article2/0,2817,2460175,00.asp>; <http://s7.vzw.com/is/content/VerizonWireless/eCatalogs/Verizon-XLTE-markets.pdf>.

⁹⁷ See Figure 13 *infra*.

⁹⁸ The White House Office of Science and Technology Policy and the National Economic Council, "Four Years of Broadband Growth," June 2013 at 2.

⁹⁹ Excludes R&D. Diana Carew and Michael Mandel, "Investment Heroes: Who's Betting on America's Future?" Progressive Policy Institute, July 2012 at 3.

range, and other factors. The significant switching by wireless customers indicates the competitive rivalry in the wireless industry. For instance, average wireless subscriber monthly churn rates have been between 2.0 percent and 2.5 percent since at least 2005.¹⁰⁰ This means that about 25 percent of customers churn in a year.¹⁰¹

74. Mobile broadband price, data coverage, and download speed are the top reasons why consumers switch providers. An industry study found that “after price, the biggest reason smartphone owners switched operators was to get better data coverage and download speeds. In fact, 40 percent said they switched operators in the past year to get better data speed and coverage compared with 26 percent who said they switched to get better voice coverage.”¹⁰² Another recent survey found that 45 percent of mobile users would be likely to switch wireless carriers to obtain better coverage.¹⁰³

75. Although wireless subscribers sometimes enter into multi-year contracts, several countervailing factors work to reduce switching costs. For example, major wireless providers pro-rate their early termination fees (“ETFs”), making switching less costly for consumers under long-term contracts.¹⁰⁴ In fact, some competitors, like T-Mobile and Sprint, pay off consumers’ ETFs if users switch to their service, which means that consumers can switch at no cost.¹⁰⁵ Moreover, “secondary markets” for mobile contracts and devices facilitate switching/cancelling of contractual obligations undertaken by users, as the Commission has noted.¹⁰⁶

¹⁰⁰ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 165.

¹⁰¹ Although some wireline churn results from people moving from an area served by their current provider to an area where that provider does not operate, most wireless broadband suppliers operate nationwide.

¹⁰² Sue Marek, “Study: Data speed is more critical than voice coverage for smartphone users,” FierceWireless, July 13, 2012, available at http://www.fiercewireless.com/story/study-data-speed-more-critical-voice-coverage-smartphone-users/2012-07-13?utm_medium=nl&utm_source=internal.

¹⁰³ Stuart Taylor, “Service Provider Wi-Fi and Small Cells: Discover What Consumers Want from Wi-Fi and Mobile,” Cisco, 2013 at 8.

¹⁰⁴ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 120.

¹⁰⁵ “T-Mobile Delivers Contract Freedom for Families By Paying Off Early Termination Fees,” January 8, 2014, available at <http://newsroom.t-mobile.com/news/t-mobile-delivers-contract-freedom-for-families-by-paying-off-early-termination-fees.htm>; “For a Limited Time, Customers Who Switch a Number to Sprint on a Family Plan Can Save up to \$650,” April 4, 2014, available at <http://newsroom.sprint.com/news-releases/for-a-limited-time-customers-who-switch-a-number-to-sprint-on-a-family-plan-can-save-up-to-650.htm>.

¹⁰⁶ Federal Communications Commission, 16th Mobile Competition Report at 121: “The emergence of a secondary market segment for mobile wireless service contracts may facilitate consumers’ ability to switch service providers.

76. Wireless broadband consumers have access to information about rival offerings and make informed decisions between competing wireless broadband providers. This information is available from marketing and advertising by wireless broadband providers, consumer groups, trade associations, other third parties, and government agencies. As the Commission has noted:

In order to make informed decisions, consumers need detailed information about the price, availability, quality, and features of mobile wireless services. All mobile wireless service providers offer resources on their websites that advertise their products, services, and prices and that give potential customers information on their networks, service plans, and terms of service. A number of third parties – such as *Consumer Reports*, trade associations, marketing and consulting firms, and several websites – also provide consumers with an overview and comparison of the mobile wireless services available in their local areas. In addition, organizations such as *Consumer Reports* and *J.D. Power* publish the results of their wireless user surveys, which rate wireless service providers based on customer satisfaction. ... Information on mobile broadband availability can also be found in the National Broadband Map.¹⁰⁷

D. Consumer benefits from wireless broadband competition

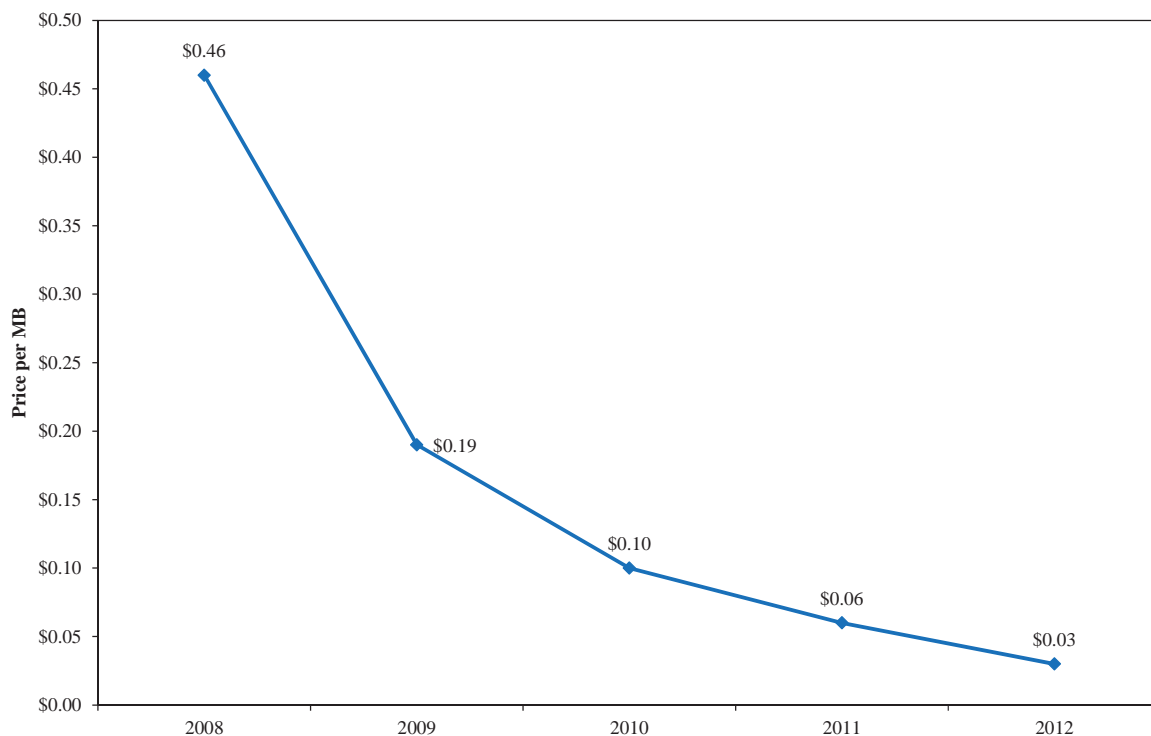
77. Competition between wireless providers has generated important consumer benefits. Mobile wireless speeds continue to rise, prices per megabyte of data continue to fall, and consumers have access to a wide and increasing variety of devices and plans. There is no indication that this competitive rivalry will diminish, or that the expanding consumer benefits generated by this competition will subside.

78. ***Lower quality-adjusted prices:*** Quality-adjusted prices for wireless broadband (such as prices per megabyte of data) have declined considerably in recent years. In the past few years, average prices for wireless data services have declined from \$0.46 per megabyte in 2008 to \$0.03 per megabyte in 2012, as shown in Figure 8 below.

... In addition to the secondary market for cellphone service contracts, there is a secondary market for iPhones and other high-end smartphones and devices.”

¹⁰⁷ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 203-204.

Figure 8: Price of Wireless Broadband



Source: Visage, "Infographic: The Staggeringly Huge Future of Mobility," September 6, 2012 available at <http://visagemobile.com/mobilityblog/2012/09/06/infographic-the-staggeringly-huge-future-of-mobility/>.

79. **Greater choice of wireless devices, applications, and services:** Wireless competition has facilitated the availability of a wide variety of devices (and associated operating systems), applications, and services that are complements to a robust wireless broadband ecosystem.¹⁰⁸ Each segment of the mobile wireless “ecosystem” is highly competitive, with significant investment and innovation by existing firms and new entrants. Competition and innovation in each of these segments has provided consumers with a wide array of innovative products and services. For instance, competition has led to the availability of a wide variety of sophisticated

¹⁰⁸ Federal Communications Commission, 15th Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, June 27, 2011 at 88: “In addition to network quality and advertising, a third component of non-price rivalry among mobile wireless service providers is the differentiation of the downstream products that they offer or that rely on their networks, including handsets/devices, operating systems, and mobile applications. . . . As mobile operating systems, and the functionalities and application stores they enable, play a more prominent role in a consumer’s mobile wireless experience, consumers are showing an increasing loyalty to particular operating systems or device platforms.”

mobile devices.¹⁰⁹ As the Commission noted, “[f]rom 2006 to 2012, the number of mobile wireless handset manufacturers that distribute in the U.S. market increased from eight to 23. During June 2012, these 23 handset manufacturers offered a total of 266 handset models to mobile wireless service providers in the United States.”¹¹⁰

80. The availability of content, applications, and services customized for a mobile environment has grown exponentially. Mobile applications (“apps”), in particular, have proliferated.¹¹¹ Apple’s App Store and Google Play currently both offer over one million apps for consumers to download for iOS and Android mobile devices respectively.¹¹² Increased wireless bandwidth offered by wireless carriers has facilitated the delivery of this mobile content.

81. ***Higher broadband speeds and availability of high-speed broadband:*** Average wireless broadband speeds have increased considerably in the past few years. 4G LTE network providers typically offer average download speeds of 5 to 12 Mbps,¹¹³ which makes them comparable to or faster than most wireline DSL services, although generally slower than wireline services using fiber or DOCSIS 3.0 technologies. North America’s average wireless data connection speed is the fastest in the world, nearly twice that available in Western Europe, and over five times the

¹⁰⁹ The Commission has noted that “mobile wireless providers continue to compete by offering consumers a variety of different mobile wireless devices with innovative features,” and that “price rivalry” between competing wireless broadband providers takes the form “developments in mobile service pricing plans.” The Commission “report[ed] evidence of significant actions, changes, and expenditures” in regards to providers’ competitive rivalry. (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 97-98, 145.)

¹¹⁰ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 216. The majority of these devices are smartphones with broadband capability. In 2013, smartphone unit sales accounted for 73 percent of total wireless handset unit sales. (Telecommunications Industry Association, “TIA’s 2014-2017 ICT Market Review and Forecast,” 2014 at 5-16.)

¹¹¹ Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 24.

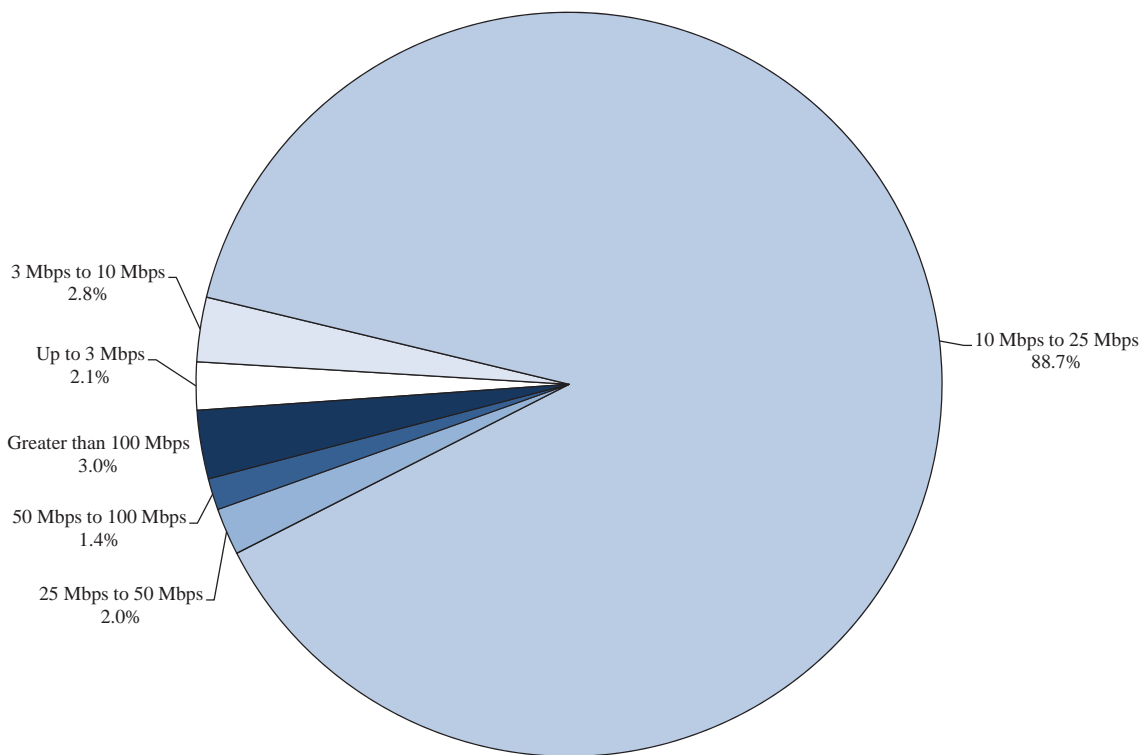
¹¹² Nathan Ingraham, “Apple Announces 1 million apps in the App store, more than 1 billion songs played on iTunes radio,” The Verge, October 22, 2013, available at <http://www.theverge.com/2013/10/22/4866302/apple-announces-1-million-apps-in-the-app-store>; Josh Ownby, “Google Play Store Hits Million – Apps Milestone,” Gazelle, August 14, 2013, available at <http://www.gazelle.com/thehorn/2013/08/14/google-play-store-hits-million-apps-milestone>.

¹¹³ For instance, Verizon’s 4G LTE network offers download speeds of 5 to 12 Mbps. (<http://www.verizonwireless.com/insiders-guide/network-and-plans/4g-lte-speeds-compared-to-home-network/>.)

global average.¹¹⁴ Cisco has recently projected that average North American wireless broadband speeds will continue to increase rapidly, and will more than double by 2018.¹¹⁵

82. Higher broadband speeds are available to the vast majority of American consumers. In mid-2012, as 4G services were being rolled out, 79 percent of Americans had access to wireless broadband speeds of 10 Mbps or higher.¹¹⁶ By mid-2013, the share of Americans with access to wireless broadband download speeds of greater than 10 Mbps had increased to over 95 percent, as shown in Figure 9 below. Only about 2 percent of consumers did not have access to download speeds of at least 3 Mbps.

Figure 9: Share of U.S. Consumers by Available Wireless Broadband Download Speeds



Note: Data as of June 30, 2013.

Source: FCC National Broadband Map, available at <http://www.broadbandmap.gov/summarize/nationwide>.

¹¹⁴ The White House Office of Science and Technology Policy and the National Economic Council, “Four Years of Broadband Growth,” June 2013 at 2. Data for 2012.

¹¹⁵ Cisco, “The Zettabyte Era: Trends and Analysis,” June 10, 2014, Table 5.

¹¹⁶ Anna-Maria Kovacs, “Telecommunications competition: the infrastructure-investment race,” Internet Innovation Alliance, October 8, 2013 at 19.

E. Increasing substitution between wireline and wireless broadband

83. While the previous sections discussed competition among *wireline* providers separately from competition among *wireless* providers, the lines between these traditional broadband network distinctions have been blurring, and are expected to continue to blur. Consumers increasingly connect to wireline and wireless networks for many of the same uses, and some consumers rely exclusively on wireless for broadband. These changes in broadband usage have been spurred by critical industry developments.

84. Innovation and investments in both wireless broadband networks and wireless devices increasingly have made wireless networks more competitive to wired networks, particularly to lower-speed wireline options. First, significant improvements in speed and capacity of wireless broadband networks have allowed consumers to perform many of the same tasks on wireless devices as they perform on computers connected via wireline networks. Although generally slower than wireline broadband options such as fiber and DOCSIS 3.0, 4G LTE network providers typically offer average download speeds of 5 to 12 Mbps that are sufficient for many uses and are comparable to or faster than traditional copper-based DSL services.¹¹⁷ As wireless broadband providers continue to improve their networks to increase speeds,¹¹⁸ and as more wireless spectrum becomes available,¹¹⁹ wireless networks are likely to become an alternative to wireline providers for a larger range of broadband users and uses. Second, the advent of advanced wireless devices, particularly tablets, has blurred the distinction between wireless and wireline *devices*, and how content providers access consumers using those devices.

85. As a result, although wireless networks do not offer the same speeds as next-generation wireline networks like cable and fiber, wireless broadband services are to some extent a competitive alternative for wireline networks for some consumers. Mobile-only broadband

¹¹⁷ For instance, Verizon's 4G LTE network offers download speeds of 5 to 12 Mbps.

(<http://www.verizonwireless.com/insiders-guide/network-and-plans/4g-lte-speeds-compared-to-home-network/>.)

¹¹⁸ For example, recent tests show that Verizon's 4G LTE service can provide between 12.7 Mbps and 53.7 Mbps. (Daniel P. Howley, "Verizon Wins NYC 4G Showdown, Sprint Dead Last," Laptop Magazine, March 14, 2014, available at <http://blog.laptopmag.com/fastest-4g-nyc/>.)

¹¹⁹ The Commission's upcoming spectrum auctions will allocate new spectrum bands to wireless use. See, e.g., "FCC Adopts Rules For First Ever Incentive Auction; Will Make Available Additional Airwaves, Increase Competition for Mobile Broadband," Federal Communications Commission News Release, May 15, 2014, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0515/DOC-327100A1.pdf.

households now account for an increasing share of total broadband connections. In particular, there were 8.5 million mobile-only broadband households in the U.S. in 2013, accounting for 8.9 percent of total broadband connections.¹²⁰ And, even consumers that maintain a wireline connection are increasingly performing some tasks over wireless broadband connections that previously had been done exclusively via a wireline connection. These tasks include web browsing, shopping,¹²¹ streaming video,¹²² and various other activities that previously were conducted primarily on PCs over wireline networks.¹²³

86. These facts indicate that consumers are growing increasingly used to performing tasks on multiple broadband platforms, and wireless networks are becoming a competitive alternative to wireline broadband for some consumers. Although the wireless broadband industry is still nascent, and evolving rapidly, these industry developments suggest that wireless networks exert some degree of competitive pressure on wireline broadband providers. With continued innovation and investment, there is the opportunity for wireless broadband to be a more attractive competitive alternative over time.

87. The proliferation of Wi-Fi networks further demonstrates this demand-side substitutability—in this case, substitution of wireline networks for wireless broadband access.

¹²⁰ Strategy Analytics, “Service Provider Strategies (SPS), North America Broadband Forecast,” April 2014 at 3.

¹²¹ Nielsen reports that 87 percent of consumers with smartphones or tablets use those devices for shopping or related activities, including researching their purchase, locating a store, comparing prices, and purchasing products or services. (Bill Siwicki, “Consumer Internet use shifts from PCs to smartphones,” *Internet Retailer*, February 20, 2014, available at <http://www.internetretailer.com/2014/02/20/consumer-internet-use-shifts-pcs-smartphones>.)

¹²² Nielsen reported that in 2013, over 50 million people were watching video on their mobile devices, up from 25 million in 2010. (“Q&A with Nielsen on the State of the Mobile Industry,” Heartland Mobile Council, September 4, 2013 available at <http://heartlandmobilecouncil.org/summit/qa-with-nielsen-on-the-state-of-the-mobile-industry/>; “Number of Americans Watching Mobile Video Grows More Than 40% in Last Year,” Nielsen, March 30, 2011, available at <http://www.nielsen.com/us/en/newswire/2011/number-of-americans-watching-mobile-video-grows-more-than-40-in-last-year.html>.) Nielsen reported that the share of Netflix and Hulu users that streamed video on their mobile phones and tablets increased eight-fold from 2011 to 2013. (“Binging Is the New Viewing for Over-the-top Streamers,” Nielsen, September 18, 2013; “What Netflix and Hulu Users Are Watching... And How,” Nielsen, July 27, 2011.)

¹²³ For instance, U.S. consumers now spend more time on the Facebook mobile app than spent accessing the Facebook website via a computer. (“The Digital Consumer,” Nielsen, February 2014 at 19.) Consumers appear to be substituting between wireless and wireline networks even for tasks conducted in the same place and/or time of day. A recent McKinsey survey found that “[e]ven when a PC is nearby, almost a quarter of smart phone owners say they prefer using their phone for email, and 23% for Internet browsing.” (Bertil Chappius, Ewan Duncan, Brendan Gaffey and Kevin Roche, “The next stage: Six ways the digital consumer is changing,” McKinsey iConsumer research, April 2012 at 3.)

To put it another way, wireline services combined with Wi-Fi is a competitive alternative to the use of wireless networks for some customers and uses. Wi-Fi networks are ubiquitous not just at home but also at the workplace, coffee shops, airports, businesses, parks, and entire cities,¹²⁴ and broadband providers are rapidly deploying “homespot” Wi-Fi networks.¹²⁵ Wireless carriers are also currently testing HotSpot 2.0, a technology that allows for seamless transition from Wi-Fi to wireless broadband signal for users with automated authentication.¹²⁶ A significant share of broadband use from mobile devices now takes place through Wi-Fi connected to a wireline network rather than wireless networks.¹²⁷

IV. The Future Outlook for Broadband

88. As described above, there has been staggering investments by broadband providers, and the competitive successes of the broadband industry to date have benefited consumers greatly. Looking forward, there are significant opportunities and challenges, as broadband providers compete to bring innovative products and services to users. The rapid growth in demand for broadband of the past few years, both on wireline and wireless networks, is expected to continue, if not accelerate. This growth in demand for broadband to a large extent will be driven by increasing demand for video content, both over wireline and wireless networks. In order to meet

¹²⁴ See, e.g., Stuart Taylor, “Service Provider Wi-Fi and Small Cells: Discover What Consumers Want from Wi-Fi and Mobile,” Cisco, 2013 at 2-3.

¹²⁵ Homespots are residential Internet gateways (such as a cable box or router) that are enabled as semi-public Wi-Fi access points for other subscribers of a broadband provider. Comcast alone plans to have 8 million Wi-Fi hotspots across the United States by the end of 2014. (Bob Fernandez, “Comcast Aims for 8 Million WiFi Hotspots,” Pilly.com, May 2, 2014, available at http://articles.philly.com/2014-05-02/business/49555320_1_comcast-corp-national-wireless-network-neil-smit.) Providers also have created Wi-Fi roaming agreements linking their hotspots. For example, the U.S. Cable Wi-Fi Consortium joins providers Comcast, Time Warner Cable, Cox, Brighthouse and Optimum, which have linked more than 200,000 hotspots. (Bank of America Merrill Lynch, “Global Wireless Matrix 1Q14, The Quad Play: How Disruptive?” April 21, 2014 at 7.)

¹²⁶ Bank of America Merrill Lynch, “Global Wireless Matrix 1Q14, The Quad Play: How Disruptive?” April 21, 2014 at 7. Apple’s latest iOS for iPhone uses HotSpot 2.0 technology.

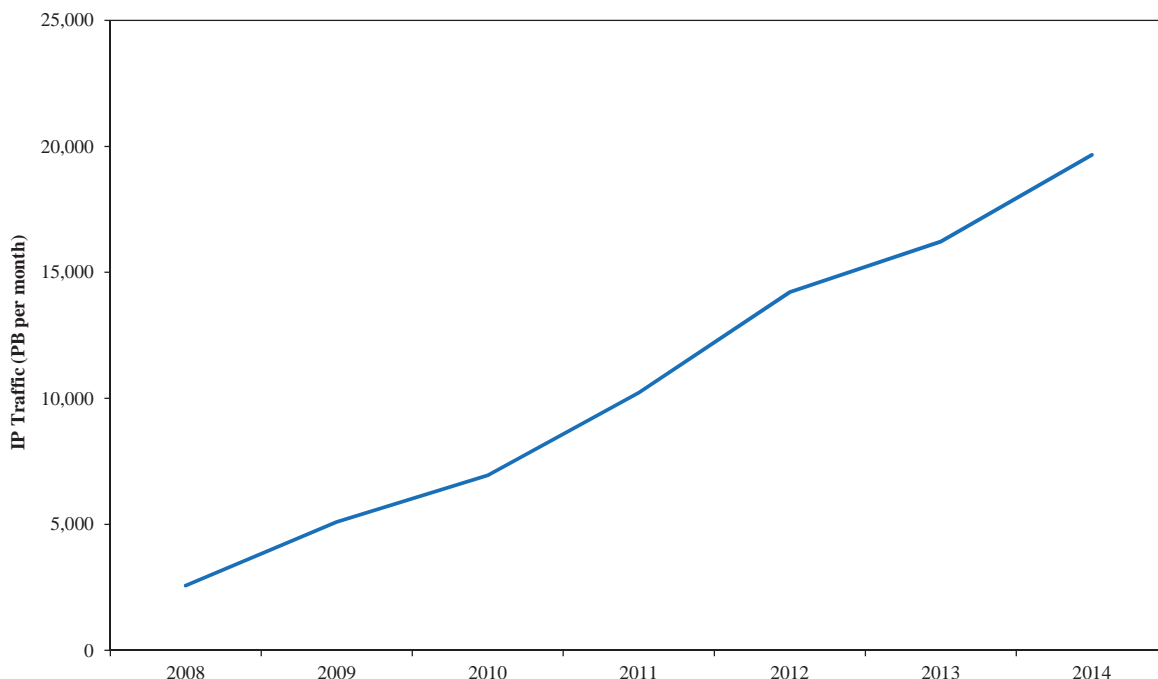
¹²⁷ About two-thirds of tablet users in the U.S. connect only via Wi-Fi. (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 238.) Another survey, conducted in 2013, found that about 80 percent of respondents connected their tablets, laptops, and e-Readers to the Internet exclusively through Wi-Fi. (Stuart Taylor, “Service Provider Wi-Fi and Small Cells: Discover What Consumers Want from Wi-Fi and Mobile,” Cisco, 2013 at 3.) Overall, more than half of data traffic from wireless devices is carried over Wi-Fi networks, and this share is expected to increase to 64 percent by 2018. (“57 Percent of Wireless Data Traffic Carried Over Wi-Fi,” CTIA, May 15, 2014, available at <http://www.ctia.org/resource-library/facts-and-infographics/archive/data-over-wi-fi>.)

this expected growth in consumer demand, and the changing broadband traffic patterns, wireless and wireline broadband providers are expected to need to continue making significant investments in network infrastructure.

A. Continued growth of consumer demand for broadband

89. ***Demand for wireline broadband networks:*** There has been rapid growth in consumer demand for high-speed broadband access in the past few years. Demand for wireline broadband has risen steadily, as shown in Figure 10 below. In particular, between 2008 and 2014, wireline broadband traffic in North America increased from about 2,600 petabytes per month to almost 20,000 petabytes per month.¹²⁸

Figure 10: North America Wireline Broadband Traffic



Note: 2014 data forecasted as of June 10, 2014.

Sources: Cisco, "Cisco Visual Networking Index: Forecast and Methodology" Reports: 2007–2012 (June 16, 2008), Table 1; 2008–2013 (June 9, 2009), Table 1; 2009–2014 (June 2, 2010), Table 3; 2010–2015 (June 1, 2011), Table 2; 2011–2016 (May 30, 2012), Table 1; 2012–2017 (May 29, 2013), Table 1; 2013–2018 (June 10, 2014), Table 1.

¹²⁸ The growth in demand for broadband is both due to an increase in the number of broadband subscribers and increase in the use per subscriber. For instance, average monthly use per subscriber of wireline broadband has more than doubled from the first half of 2011 to the second half of 2013. (Parks Associates, "New Trends in Digital Delivery and CDNs," January 2014 at iv.)

90. Consumer demand for wireline broadband is expected to continue to grow rapidly, as is the consumer demand for higher-speed wireline broadband services. For example, U.S. wireline broadband traffic is expected to double between 2013 and 2018.¹²⁹

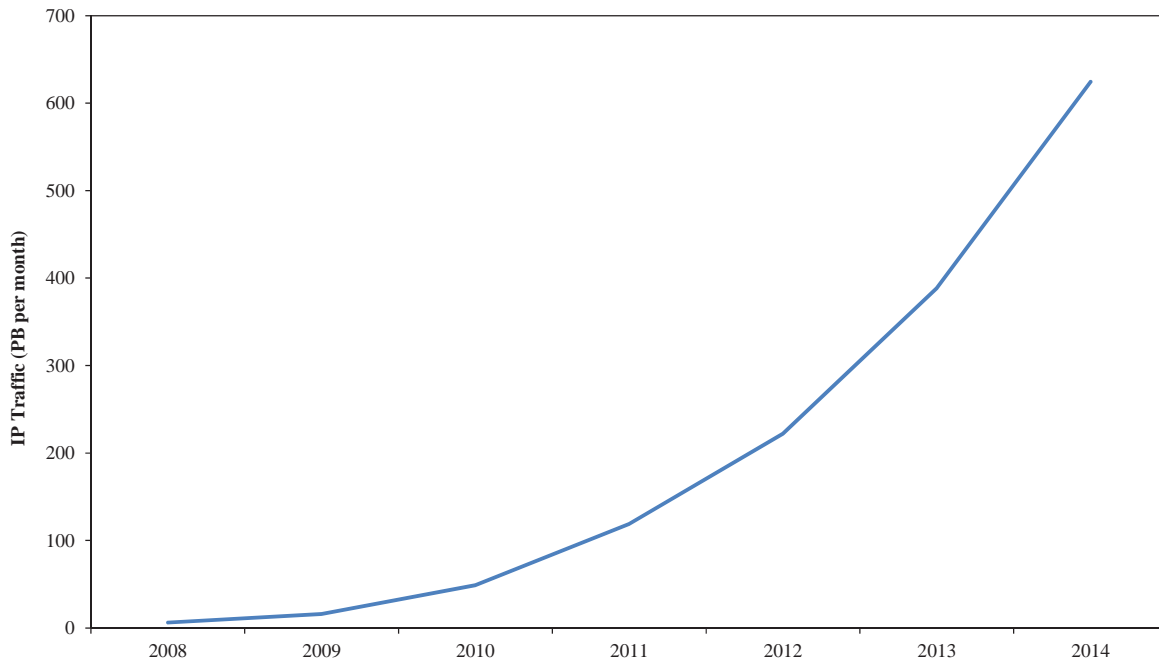
91. ***Demand for wireless broadband networks:*** The growth in consumer demand for wireless broadband has been even more staggering in the past few years, as shown in Figure 11 below. The launch of the iPhone in June 2007 and the subsequent growth of smartphones have led to an explosion in mobile broadband usage, as mobile Internet-connected devices proliferated.¹³⁰ The deployment to 4G technology also has contributed to the growth in demand for wireless broadband, as 4G LTE devices sold in 2013 used 40 percent more bandwidth than the 3G devices sold a year prior.¹³¹

¹²⁹ “Cisco VNI Forecast Highlights,” Cisco available at http://www.cisco.com/web/solutions/sp/vni/vni_forecast_highlights/index.html.

¹³⁰ The Commission has noted: “Disruptive technology transformations happen once every 10 to 15 years. Mobile broadband represents the convergence of the last two great disruptive technologies – Internet computing and mobile communications – and may be more transformative than either of these previous breakthroughs.” (Federal Communications Commission, “Connecting America: The National Broadband Plan,” March 16, 2010 at 75.)

¹³¹ Telecommunications Industry Association, “TIA’s 2014-2017 ICT Market Review and Forecast,” 2014 at 5-2.

Figure 11: North America Wireless Broadband Traffic



Note: 2014 data forecasted as of February 5, 2014.

Sources: Cisco, "Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update" Reports: 2008-2013 (January 29, 2009), Table 1; 2009-2014 (February 9, 2010), Table 7; 2010-2015 (February 1, 2011), Table 9; 2011-2016 (February 14, 2012), Table 5; 2012-2017 (February 6, 2013), Table 6; 2013-2018 (February 5, 2014), Table 6.

92. The rapid growth in consumer demand for wireless broadband is expected to continue for the foreseeable future, which will require significant investments and innovation by wireless broadband providers and various other industry participants. For example, wireless broadband traffic is expected to increase by a factor of eight between 2013 and 2018 in the United States, from 360 petabytes per month to 2,700 petabytes per month.¹³² This growth will create significant challenges for wireless providers due to the significant capacity constraints that they face.¹³³

¹³² "Cisco VNI Forecast Highlights," Cisco available at http://www.cisco.com/web/solutions/sp/vni/vni_forecast_highlights/index.html.

¹³³ See, e.g., Telecommunications Industry Association, "TIA's 2014-2017 ICT Market Review and Forecast," 2014 at 5-14, 5-15: "While LTE rollouts have helped accommodate the current demand for data, mobile network operators are already facing capacity issues with their current spectrum holdings. Meanwhile, data traffic continues to surge. The volume of data traffic is expected to be 10 times greater in 2018 than in 2013. Those traffic volumes will require a next-generation or 5G network. Near instantaneous video downloading, sub-millisecond latency and virtual overlay are among the features a 5G network hopes to deliver. ... major efforts are taking place to begin the process of identifying the technologies for 5G."

93. The growth in demand for broadband services, both on wireline and wireless networks, will be driven largely by bandwidth-intensive applications and services, such as video. The bandwidth used by different applications varies tremendously. Some consumer uses, such as e-mail, impose very little bandwidth cost, while other uses, such as video delivered by over-the-top (“OTT”) services, are much more bandwidth-intensive. Table 1 below shows the share of wireline broadband downstream traffic by content provider. The top two providers in terms of bandwidth use, Netflix and YouTube, account for over 47 percent of traffic. The top eight providers account for almost two-thirds of the total wireline broadband Internet traffic, with seven of these eight providers offering video services.¹³⁴

Table 1: Top Wireline Bandwidth Using Applications (2014)

Rank	Application	Type of Application	Share of Downstream Traffic
1	Netflix	Video	34.2%
2	YouTube	Video	13.2%
3	iTunes	Video/Music	3.6%
4	BitTorrent	Video/Music	3.4%
5	MPEG	Video	2.9%
6	Facebook	Social Media	2.0%
7	Amazon Video	Video	1.9%
8	Hulu	Video	1.7%
	Total		62.9%

Notes: Data for North America, 2014. Based on peak bandwidth use period.
Source: Sandvine, "Global Internet Phenomena Report 1H 2014," May 15, 2014, Table 2.

94. Video services will continue to drive demand for bandwidth.¹³⁵ Cisco predicts that the share of Internet traffic from video providers (including wireless and wireline in aggregate) will grow from 66 percent in 2013 to 79 percent in 2018.¹³⁶ In fact, more and more consumers are

¹³⁴ Moreover, these specific uses are increasingly occurring at particular times of day. The top two content providers in terms of bandwidth usage, Netflix and YouTube, accounted for 51 percent of broadband traffic at peak times on wireline broadband networks. (Parks Associates, “New Trends in Digital Delivery and CDNs,” January 2014, Figure 4.)

¹³⁵ SNL Kagan, “Media Trends Actionable Metrics, Benchmarks & Projections For Major Media Sectors,” December 2013 at 54.

¹³⁶ Cisco, “Cisco VNI: Forecast and Methodology, 2013-2018,” June 10, 2014 at 2.

exclusively viewing video via broadband networks. SNL Kagan estimates such “cord-cutting” could grow from 4.7 million households at the end of 2012 to nearly 13 million households by 2017.¹³⁷ Moreover, ultra-high definition (UHD) video streaming, which has a 18 Mbps bit rate (more than 9 times that of standard definition video streaming), is expected to further increase demand for broadband bandwidth.¹³⁸

95. Video usage also will account for most broadband traffic on wireless networks. In the next few years, the volume of mobile video traffic is expected to increase tenfold, and more than half of all mobile data traffic is projected to come from video.¹³⁹ These trends will create even greater challenges for wireless providers due to the significant capacity constraints that they face.

96. The growth in demand for broadband in the next few years also will be driven by the “Internet of Things,” which includes broadband-connected appliances, cars, wearable devices, etc., essentially involving machine-to-machine broadband use.¹⁴⁰ Gartner estimates that by 2020 there will be 26 billion broadband-connected devices globally, and this will have a considerable impact on data centers and network infrastructure.¹⁴¹ Cisco expects the number of broadband-connected wearable devices (*e.g.*, Google Glass, smart watches, fitness monitors) to grow globally from 22 to 177 million during the same period.¹⁴² The growth of these connected devices will require investments in infrastructure and innovative solutions to handle them.¹⁴³

¹³⁷ SNL Kagan, “Media Trends Actionable Metrics, Benchmarks & Projections For Major Media Sectors,” December 2013 at 10.

¹³⁸ By 2018, Cisco predicts that UHD will account for 22 percent of VOD broadband traffic worldwide. (Cisco, “The Zettabyte Era: Trends and Analysis,” June 10, 2014, Figure 6.)

¹³⁹ It is projected that the volume of mobile video traffic in 2017 will be nine times the volume in 2012. (Federal Communications Commission, 16th Annual Mobile Wireless Competition Report at 173.) By 2019, more than 50 percent of global mobile data traffic is expected to come from video, up from about 40 percent in 2013. (Ericsson, “Ericsson Mobility Report On the Pulse of the Networked Society,” June 2014 at 13, available at http://www.ericsson.com/news/1790097?categoryFilter=press-releases_1270673222_c.)

¹⁴⁰ See, *e.g.*, Telecommunications Industry Association, “TIA’s 2014-2017 ICT Market Review and Forecast,” 2014 at 2-8.

¹⁴¹ “Gartner Says the Internet of Things Will Transform the Data Center,” Gartner Press Release, March 19, 2014, available at <http://www.gartner.com/newsroom/id/2684616>.

¹⁴² Cisco, “Cisco Visual Networking Index (VNI) Global and North American Mobile Data Traffic Forecast Update (2013-2018),” February 2014 at 28.

¹⁴³ Jerome Nadel, “Internet of Things Hype Needs a Health Dose of Design Thinking,” *Wired*, December 19, 2013, available at <http://www.wired.com/2013/12/internet-things-hype-needs-healthy-dose-design-thinking/>: “Today’s

B. Continued investment and innovation competition

97. Considerable investments by broadband providers in upgrading wireline and wireless networks are expected to continue in order to meet this growth in demand. Studies project that, despite significant capital expenditures by U.S. wireless broadband providers in the past few years, these investments will need to continue in order to build the networks necessary to meet consumer demand for wireless broadband.

98. *Investments in wireline networks:* Analyst reports project that significant ongoing investments from cable broadband providers will be necessary over the coming few years in order to meet the growing demand for broadband. For instance, Comcast's capital expenditures are projected to rise from about \$6.6 billion in 2013 to \$7.9 billion by 2016.¹⁴⁴ Time Warner Cable's capital expenditures are projected to rise from about \$3.2 billion in 2013 to \$3.8 billion in 2016.¹⁴⁵ Verizon and AT&T are also expected to continue sizeable infrastructure investments in their wireline FiOS and U-verse offerings, respectively.¹⁴⁶

99. Investments in Internet backbone infrastructure also have been sizeable and are projected to continue growing.¹⁴⁷ For the U.S. wireline industry as a whole, including the last mile and the backbone, one recent report projects that infrastructure spending will rise from \$38.6 billion in 2013 to \$42.9 billion by 2017 (see Figure 12 below).

power, bandwidth and processing infrastructure isn't quite ready to support 20-30 connected devices, and the greater infrastructure isn't quite optimized to quickly and effectively move the data."

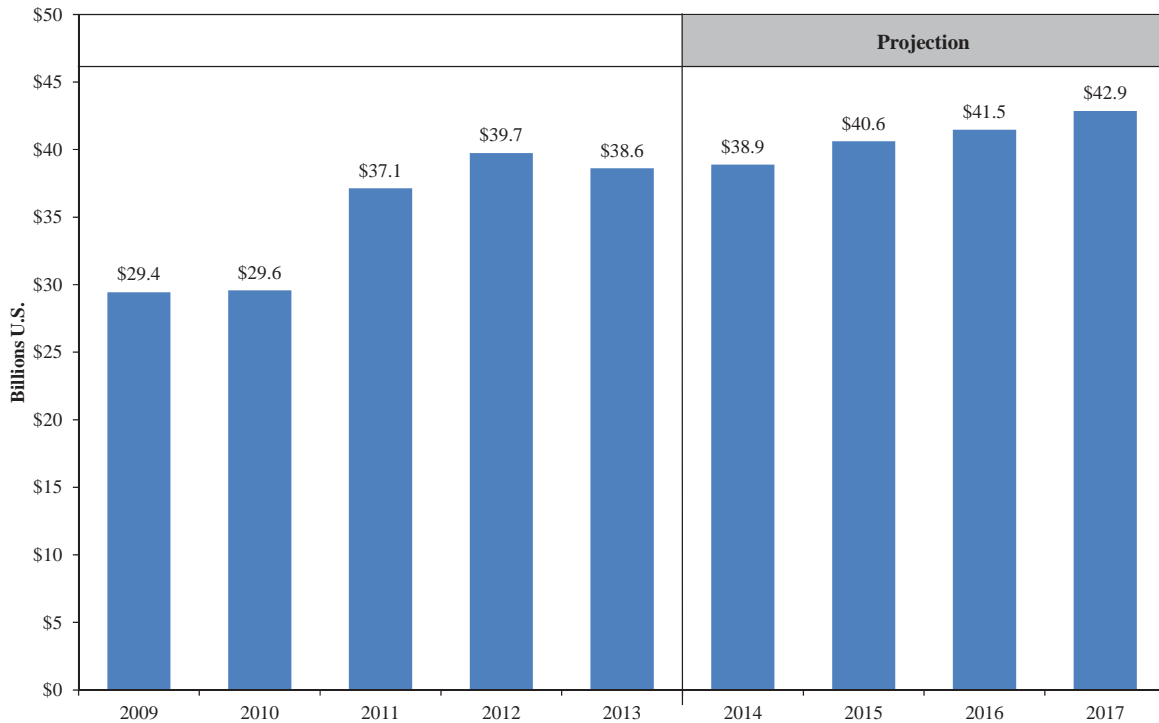
¹⁴⁴ Bank of America Merrill Lynch, "Comcast Corp: Throwback to Pay-TV roots," April 22, 2014 at 2; Bank of America Merrill Lynch, "Comcast Corp: A 'positive' surprise," January 9, 2014 at 2.

¹⁴⁵ Bank of America Merrill Lynch, "Time Warner Cable Inc.: In the Shareholder Interest," February 17, 2014 at 2.

¹⁴⁶ See, e.g., Bank of America Merrill Lynch, "Global Wireless Matrix 1Q14 The Quad Play: How Disruptive?" April 21, 2014 at 159, 193.

¹⁴⁷ U.S. Internet backbone investment has grown from \$12.9 billion in 2010 to \$20.1 billion in 2013, and is projected to increase to \$24 billion by 2017. (Telecommunications Industry Association, "TIA's 2014-2017 ICT Market Review and Forecast," 2014 at 3-44.)

Figure 12: U.S. Total Wireline Broadband Investment

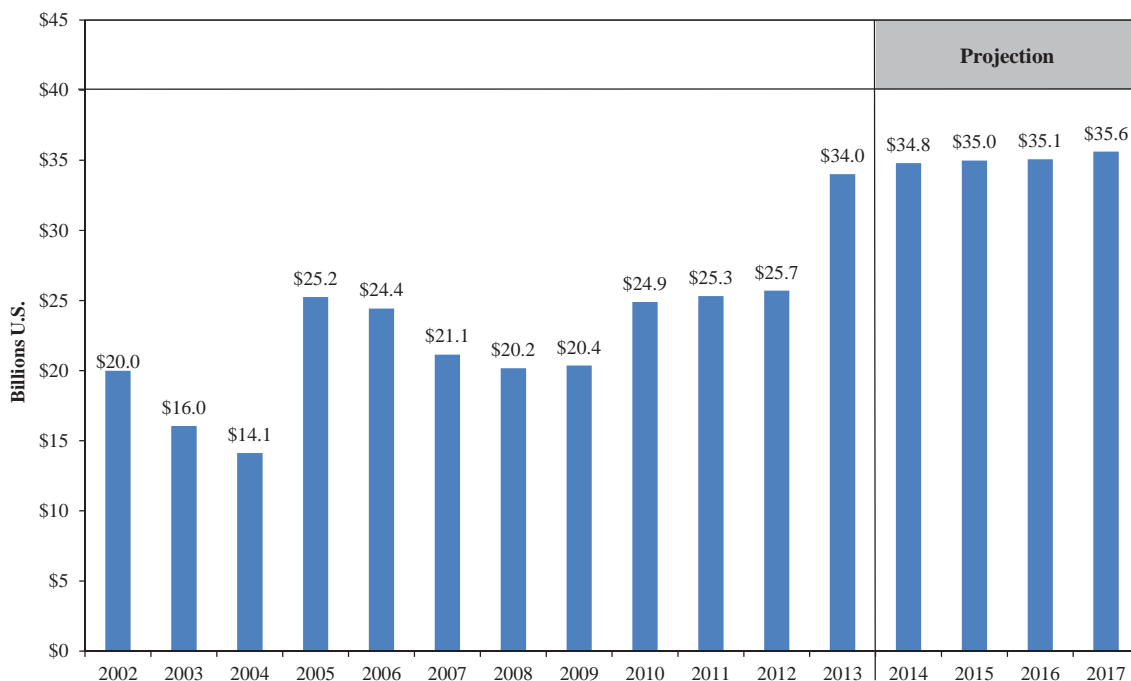


Source: Telecommunications Industry Association, "TIA's 2014-2017 ICT Market Review and Forecast," 2014 at 3-46.

100. **Investments in wireless networks:** Increasing demand for wireless broadband will require increased investment by wireless broadband providers. Studies project capital expenditures by U.S. wireless broadband providers of around \$35 billion a year from 2013-2017, up from around \$25 billion a year for 2010-2012 (see Figure 13 below). The limited availability of spectrum is a particular challenge for wireless broadband, requiring significant investments and innovative technological solutions that must be developed by industry participants.¹⁴⁸

¹⁴⁸ See, e.g., Telecommunications Industry Association, "TIA's 2014-2017 ICT Market Review and Forecast," 2014 at 5-15: "[s]pectrum is the key constraint. Spectrum in the 900, 1800, 2100 and 2600 MHz bands is being used for LTE, and the more recent availability of spectrum in the 700 MHz and 800 MHz bands has helped foster new LTE rollouts using those bands. Small cell deployments will play a major role in the near-term in alleviating congestion by offloading traffic to the wired network. Going forward, it is envisioned that spectrum below the 700 MHz band will be used for a combined broadband and broadcast network. In addition, unlicensed spectrum in the 5 GHz band could provide additional capacity to offload traffic, with spectrum in the 60 GHz band possibly serving this function in the future."

Figure 13: U.S. Wireless Broadband Provider Investment



Note: 2012 estimated based on doubling investment amount for first half of year.

Sources: Federal Communications Commission 16th Annual Mobile Wireless Competition Report, Table 8; PCIA (Wireless Infrastructure Association), "Wireless Broadband Infrastructure: A Catalyst for GDP and Job Growth 2013-2017," Table A; CTIA (Wireless Association), "US Investment Four Times More in Networks," available at <http://www.ctia.org/resource-library/facts-and-infographics/archive/us-investment-networks>.

101. However, the biggest challenge is that the future of broadband use is highly uncertain. How consumer usage patterns and demands will evolve, and the business models that will develop to meet consumer demands are largely unknown. The relatively short history of the Internet is filled with examples of firms introducing new business models that have changed how consumers use the Internet. The tremendous innovation that has occurred in the past few years is expected to continue, and future innovation may dwarf the advances of the past. As I discuss below, this innovation will require experimentation with new services, business models, pricing structures, and network management.

V. Implications of Market Competition for Proposed Regulation

102. The Commission should give broadband providers broad flexibility to experiment with and implement novel service offerings and business models. As I discuss below, there are limited risks and significant benefits to competition and consumers of allowing differentiated service models, network management, and pricing arrangements with content providers.

A. Limited risk that differential service models, network management, and pricing arrangements would harm consumers and competition

103. Given the competitiveness of the industry, there is little risk that broadband providers would adopt differential service models, network management, or pricing that would harm competition and consumers. The existence of firms with market power, or limited competitive constraints, is a necessary condition for firms to have the incentive and ability to enter into vertical business arrangements that harm competition and consumers. But the vast majority of consumers have the ability to choose among different broadband providers offering high-quality broadband services. This is particularly true in areas where fiber and DOCSIS 3.0 cable services compete head-to-head, and also within the highly competitive wireless broadband marketplace. And, while legacy technologies such as DSL are typically slower than these more advanced services, they nonetheless compete to some extent for some customers (*e.g.*, customers who may not put a premium on speed or who are price-sensitive). Moreover, even if some share of consumers have limited broadband options, the behavior of broadband providers with respect to those customers is likely to be constrained by competition for other customers who do have strong competitive alternatives. That is, competition for consumers with high-quality broadband alternatives also can discipline broadband provider conduct with regard to consumers living in areas without the same alternatives.

104. The competitive constraint on broadband providers is buttressed by the fact that information on provider practices is widely available. Consumers can monitor the practices and performance of their broadband provider, such as speeds to download particular content, and switch to a rival provider if they cannot get adequate access to the content they desire.¹⁴⁹ Numerous third-party websites and publications provide detailed information to consumers, and an active online community closely monitors providers' practices. And, the Commission's own transparency rules will further ensure that the information necessary to evaluate the performance of broadband providers is available to consumers.¹⁵⁰ Moreover, because broadband consumers

¹⁴⁹ A recent *Consumer Reports* survey found that 71 percent of consumers "would attempt to switch to a competing Internet service provider (ISP) if their provider were to try to block, slow down, or charge more for" certain content. ("71% of U.S. households would switch from providers that attempt to interfere with Internet," *Consumer Reports*, February 18, 2014, available at <http://www.consumerreports.org/cro/news/2014/02/71-percent-of-households-would-switch-if-provider-interferes-with-internet-traffic/index.htm#survey>.)

¹⁵⁰ *Open Internet Order*, ¶¶ 53-61.

often “multi-home”—*i.e.*, use various different broadband providers (such as a wireline broadband service at home, a wireline broadband service at work, and one or more wireless broadband services)—consumers can compare the performance of broadband networks in terms of the speed and other aspects of the quality of transmission.

105. The risk of losing customers presents a substantial economic threat to broadband providers. The provision of broadband access services, both over wireline and wireless networks, entails significant fixed (and sunk) costs of deploying the network and relatively low marginal costs of serving existing subscribers. As a result of these fundamental economics of the broadband industry, the expected revenues from a broadband subscriber during their average expected lifetime of use (referred to as the “life-time subscriber value,” or LTV) is substantial.¹⁵¹ And, accordingly, broadband providers spend considerable sums in competing to attract new subscribers (referred to as “subscriber acquisition costs”).

106. The ability of consumers to switch broadband providers, and the potential for substantial foregone revenues from subscriber defections, creates significant incentives for broadband providers to implement business practices that benefit customers. The risk of losing subscribers also provides a significant competitive constraint on broadband providers in implementing service models, pricing arrangements, or network management approaches that are harmful to consumers. The proliferation of consumer review sites, user forums, and blogs intensifies this competitive constraint, by providing a means for dissatisfied customers to inform and persuade other consumers, thereby putting pressure on broadband providers to offer the optimal service possible for their users.

B. Differential network management and pricing arrangements have the potential to enhance competition and benefit consumers

107. While there is very limited risk that broadband providers would adopt pricing and network management approaches that would harm consumers and competition, the benefits of allowing flexibility in the business models adopted by broadband providers are potentially very

¹⁵¹ For example, a recent study estimated the “Customer Lifetime Value” of a cable subscriber to be between \$2,000 and \$5,000 for customers that subscribed to a service package which included broadband (*e.g.*, video/data, video/data/voice). (Robert F. Cruickshank III, “Financial Model for Measuring Cost Savings Driven by Service Operations that Impact Customer Experience and Voluntary Disconnects,” 34(4) *Broadband Journal* 66 (2012).)

large. Arrangements between broadband providers and content or application providers are vertical in nature. Vertical arrangements are generally procompetitive, and the economic literature recognizes various efficiencies that can be achieved through vertical contracts, vertical restrictions, and other arrangements.¹⁵² These efficiencies can benefit consumers in the form of lower prices, higher quality, greater product variety, and/or enhanced innovation. This is not to say that vertical arrangements can never be anticompetitive, but such unique instances can be addressed through ex post enforcement, and do not justify ex ante regulation that imposes a blanket ban or other substantial restrictions on vertical contractual arrangements between broadband and content providers.

108. Differential network management and pricing arrangements have the potential to generate significant benefits for consumers, competition, and innovation. For instance, commercially negotiated “two-sided” pricing approaches could benefit consumers, content providers, and broadband providers alike. Most directly, positive prices to content providers would tend to lower prices to subscribers.¹⁵³ This is because a larger subscriber base enhances the value of the network to content providers, and therefore raises the potential revenues that a broadband provider might earn from content suppliers if it offers attractive negotiated arrangements.¹⁵⁴ The ability to earn revenues from content providers therefore enhances competition for subscribers, and creates incentives to lower prices and increase the quality of services offered to subscribers. Such two-sided pricing arrangements clearly can benefit subscribers. And, the content provider also can benefit if the negotiated arrangement leads more consumers to use its services. The possibility of entering commercially negotiated arrangements with content providers also can provide a source of revenues to invest in providing high-quality broadband services at low prices, while also providing an incentive to attract more customers to the broadband network.

¹⁵² Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization*, Prentice Hall (4th Edition), May 13, 2004 at 414-431.

¹⁵³ One example of a two-sided pricing arrangement is sponsored or partially sponsored data arrangements where subscribers are on usage-based pricing plans. For instance, a content provider may enter into an arrangement with a broadband provider such that subscribers can use the content provider’s services without the traffic counting towards the subscriber’s usage-based charges.

¹⁵⁴ This is referred to as *cross-platform* network effects, whereby the presence of members of one user group on a platform increases the value to members of another user group. (See, e.g., Michael L. Katz and Carl Shapiro, “Systems Competition and Network Effects,” 8 *Journal of Economic Perspectives* 93 (1994).)

109. This interconnection between pricing on the two sides of a network or platform—in this case, the content and subscriber sides—has been discussed extensively in the economics literature on “two-sided” markets.¹⁵⁵ Importantly, the economics literature on two-sided markets shows that there is no economic basis that mandating “free” access to one side of the market (in this case, content providers) is good for competition, consumer welfare, or innovation.¹⁵⁶

110. Although, to date, the competitive equilibrium seems generally to be one where last mile broadband providers have not directly entered into pricing arrangements with content and application providers, industry developments may make two-sided pricing arrangements beneficial.¹⁵⁷ Diverse and innovative pricing and network management arrangements are likely to benefit consumers in the future, especially given the significant diversity of applications, uses, and consumer preferences.

VI. Conclusions

111. Given the competitiveness of the broadband industry, any “Internet Openness” rules adopted by the Commission should give broadband providers broad flexibility to implement new and novel service offerings and business models, including differentiated network management and pricing arrangements with content providers that have the potential to provide valuable alternatives to consumers. Ex-ante regulation that limits flexibility in business arrangements would be especially inefficient given the nascent and rapidly changing broadband environment,

¹⁵⁵ See, e.g., Benjamin Klein, Andres V. Lerner, Kevin M. Murphy & Lacey L. Plache, “Competition In Two-Sided Markets: The Antitrust Economics Of Payment Card Interchange Fees,” *73 Antitrust Law Journal* 571 (2006); Richard Schmalensee, “Interchange Fees: A Review of the Literature,” *1 Payment Cards Economic Review* 25 (Winter 2003); Jean-Charles Rochet & Jean Tirole, “Cooperation Among Competitors: Some Economics of Payment Card Associations,” *33 RAND Journal of Economics* 549 (Winter 2002); Julian Wright, “The Determinants of Optimal Interchange Fees in Payment Systems,” *52 Journal of Industrial Economics* 1 (March 2004).

¹⁵⁶ See, e.g., Benjamin Klein, Andres V. Lerner, Kevin M. Murphy & Lacey L. Plache, “Competition In Two-Sided Markets: The Antitrust Economics of Payment Card Interchange Fees,” *73 Antitrust Law Journal* 571 (2006); Richard Schmalensee, “Interchange Fees: A Review of the Literature,” *1 Payment Cards Economic Review* 25 (Winter 2003); Jean-Charles Rochet & Jean Tirole, “Cooperation Among Competitors: Some Economics of Payment Card Associations,” *33 RAND Journal of Economics* 549 (Winter 2002).

¹⁵⁷ However, there are instances in which content providers “sponsor” their customers’ data usage. For example, Amazon’s Kindle Paperwhite reader offers wireless broadband connectivity with no monthly fees or contracts for the user. Moreover, as discussed, it is common for content providers to pay to enable faster and more reliable content delivery, including through CDNs, which suggests that there may be demand by content providers for prioritization arrangements.

and the significant uncertainty regarding broadband industry developments in the coming years. There is significant uncertainty regarding how consumer usage patterns will evolve in light of the ever-changing array of online applications and services that are available, the types of broadband business models that may emerge, and what will be the optimal network management and pricing arrangements. As a result, there is no reason to believe that restricting business arrangements implemented by broadband providers, without a clear showing that such arrangements inhibit competition, would enhance consumer welfare. More likely, ex ante regulation that restricts the ability of providers to experiment with and implement legitimate business arrangements would impose considerable costs, distort competition and market outcomes, and reduce investment incentives, to the detriment of consumers.

I declare under penalty of perjury that the foregoing is true and correct.

A handwritten signature in blue ink that reads "Andres V. Lerner". The signature is fluid and cursive, with the first name being the most prominent.

Andres V. Lerner, Ph.D.
July 15, 2014

Appendix A: Qualifications

112. I am an Executive Vice President at Compass Lexecon. I received my bachelor's degree in Economics from the University of California at Berkeley and my Master's and Ph.D. degrees in Economics at the University of California at Los Angeles (UCLA). My areas of economic expertise are antitrust, industrial organization, regulation, and econometrics. I have applied my expertise to a wide variety of industries, including wireless telecommunications, broadband services, mobile devices, cable and satellite television, online search, e-commerce, online advertising, payment cards, pharmaceuticals, semiconductors, motion picture, video games, automotive, and airlines. I have presented economic testimony and submitted declarations in regulatory proceedings in several forums, including the U.S. Federal Trade Commission, the Antitrust Division of the U.S. Department of Justice, and the U.S. Federal Communications Commission.

113. I have been named one of the foremost competition economists in The International Who's Who of Competition Economists for 2014. I have published scholarly articles in leading economic and legal journals, including the *American Economic Review*, the *Antitrust Law Journal*, and the *Antitrust Bulletin* and have co-edited a collection of seminal articles in antitrust economics. I have taught Economics as a Visiting Professor at the University of Southern California Marshall School of Business. I am a member of the American Economics Association and the American Bar Association.