

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

In the Matter of)
)
Inquiry Concerning Deployment of Advanced) GN Docket No. 17-199
Telecommunications Capability to All Americans in)
a Reasonable and Timely Fashion)

To: The Commission

COMMENTS OF CTIA

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TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY.....1

II. BY ANY RATIONAL MEASURE, MOBILE BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY......2

 A. The Commission Appropriately Focuses This Inquiry on Progress in Broadband Deployment.....2

 B. Investment in U.S. Mobile Wireless Broadband Networks Has Expanded Coverage and Capacity.....4

 C. The Wireless Industry Continues to Innovate and Enable Mobile Wireless Broadband to Become a Central Part of American Consumers’ Lives.7

 D. The Rapid Growth in the Internet of Things Is Supported by the Reasonable and Timely Deployment of Mobile Wireless Broadband Services.14

III. THE COMMISSION SHOULD CONSIDER AVAILABLE DATA, RATHER THAN ESTABLISH ARBITRARY BENCHMARKS, TO DETERMINE THAT MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.16

 A. Rigid Benchmarks Are Not Suitable to Measure Ever-Evolving Mobile Wireless Broadband Services Across the Diverse U.S. Market.17

 B. The Innovative Offerings Described Herein and Data on Consumer Satisfaction Show That Mobile Wireless Broadband Deployment Is Meeting and Exceeding Consumers’ Demands.18

IV. TO ENSURE MOBILE WIRELESS BROADBAND DEPLOYMENT REMAINS REASONABLE AND TIMELY, THE COMMISSION SHOULD STRIKE THE RIGHT BALANCE IN ITS REGULATORY POLICIES......20

 A. Allocating More Low-, Mid-, and High-Band Spectrum for Exclusive Licensed Use Remains Critical to Continued Reasonable and Timely Deployment of Mobile Broadband.20

 B. The Commission Should Modernize its Siting Policies to Advance the Deployment of Wireless Infrastructure.21

 C. The Commission Should Remove Burdensome Title II Requirements that Create Regulatory Barriers to Wireless Network Deployment.24

 D. The Commission Should Move Forward With Mobility Fund Support for Unserved Rural Areas.25

V. CONCLUSION.26

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CTIA¹ respectfully submits these comments in response to the Federal Communications Commission’s (“Commission’s”) *Notice of Inquiry* (“*NOI*”) regarding the agency’s forthcoming 2017 report to Congress on “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”² As discussed in more detail below, basic statutory interpretation and market realities alike dictate a determination that mobile wireless broadband has been, and continues to be, more than reasonable and timely.

I. INTRODUCTION AND SUMMARY.

As the *NOI* correctly notes, the most faithful approach to fulfilling the Commission’s Section 706 obligation is to consider whether *progress* in broadband deployment is reasonable and timely—and not, as in past years, by considering whether such deployment already is

¹ CTIA[®] (www.ctia.org) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st-century connected life. The association’s members include wireless carriers, device manufacturers, suppliers as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. The association also coordinates the industry’s voluntary best practices, hosts educational events that promote the wireless industry, and co-produces the industry’s leading wireless tradeshow. CTIA was founded in 1984 and is based in Washington, D.C.

² *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Thirteenth Section 706 Report Notice of Inquiry, FCC 17-109 (rel. Aug. 8, 2017) (“*NOI*”), quoting 47 U.S.C. § 1302(b).

complete and ubiquitous.³ The data discussed below demonstrate that mobile wireless broadband deployment has not only expanded rapidly, but also that, as a result, consumers are increasing their reliance on these services. In light of such successes, which include the proliferation of innovative new mobile broadband-contingent services and products, the Commission must conclude that mobile wireless broadband deployment has been and continues to be reasonable and timely. To ensure that mobile wireless broadband deployment remains reasonable and timely looking forward, the Commission should focus on achieving the optimal regulatory policy balance with regard to spectrum, infrastructure, and universal service, among other policies.

II. BY ANY RATIONAL MEASURE, MOBILE BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.

A. The Commission Appropriately Focuses This Inquiry on Progress in Broadband Deployment.

The Commission is correct to focus its examination on whether advancement in broadband deployment is reasonable and timely. Congress required the agency to report on an annual basis “whether advanced telecommunications capability *is being deployed* to all Americans in a reasonably timely fashion.”⁴ This formulation in the annual reporting requirement indicates that Congress intended for the Commission to report on the ongoing progress of deployment. Were it Congress’s intent to seek Commission input on the *completeness* of deployment, Congress would be expected to direct the Commission to report on whether advanced telecommunications capability “has been” deployed in a reasonable and timely fashion, which it did not. Thus, the *NOI* correctly identifies the relevant question as

³*NOI* ¶ 4 (expressing the Commission’s belief that “this is the most faithful approach to fulfilling” its statutory obligation).

⁴ 47 U.S.C. § 1302(b) (emphasis added).

“whether the *progress* being made in the deployment of advanced telecommunications capability is *occurring* in a reasonable and timely fashion.”⁵

As then-Commissioner Pai noted in his dissent to the agency’s 2015 negative finding, the only way for the Commission to determine that broadband is *not* being deployed on a reasonable and timely basis in the face of overwhelming data is “by ignoring the consistent progress in Internet connectivity that’s obvious to anyone with a digital connection and an analog pulse.”⁶ Indeed, as Commissioner O’Rielly rightly pointed out in his dissent to last year’s equally inaccurate negative finding, the “idea that we need to see close to 100 percent availability of [fixed and mobile broadband] in order to reach a positive finding is ludicrous.”⁷

Today, both the availability of mobile wireless broadband to almost the entire nation, and the incredible array of innovative services that continue to emerge in reliance on this availability, necessitate a positive finding under Section 706. The Commission should therefore proceed with its inquiry into whether the progress of broadband deployment is reasonable and timely—and with respect to mobile wireless broadband deployment, the answer is unquestionably “yes.”

⁵ *NOI* ¶ 4 (emphasis added).

⁶ *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*, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, 1486 (2015) (“*2015 Report*”) (dissenting statement of then-Commissioner Ajit Pai).

⁷ *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*, 2016 Broadband Progress Report, 31 FCC Rcd 699, 783 (2016) (“*2016 Report*”) (dissenting statement of Commissioner Michael O’Rielly).

B. Investment in U.S. Mobile Wireless Broadband Networks Has Expanded Coverage and Capacity.

Wireless providers remain focused on improving the quality and expanding the capacity of their networks to meet consumers' growing demand for wireless connectivity and data consumption. As a result of the wireless industry's cumulative investment, almost every American now lives in a location with access to advanced mobile wireless services. According to the Commission's most recent Mobile Wireless Competition Report, 4G LTE service is available to 99.7 percent of Americans, covering more than 71 percent of the total U.S. land area.⁸ For perspective, far more Americans currently have access to 4G LTE service than had access to any mobile data services a mere eight years ago, when the Commission last found that the wireless market was effectively competitive.⁹ That year, mobile broadband service—which was then defined to include services in excess of 200 kbps¹⁰—was available to 92.3 percent of Americans and covered only 40 percent of the total U.S. land area.¹¹

⁸ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Nineteenth Report, 31 FCC Rcd 10534, 10564 ¶ 39 Chart III.A.2 (2016) (“*Nineteenth Report*”).

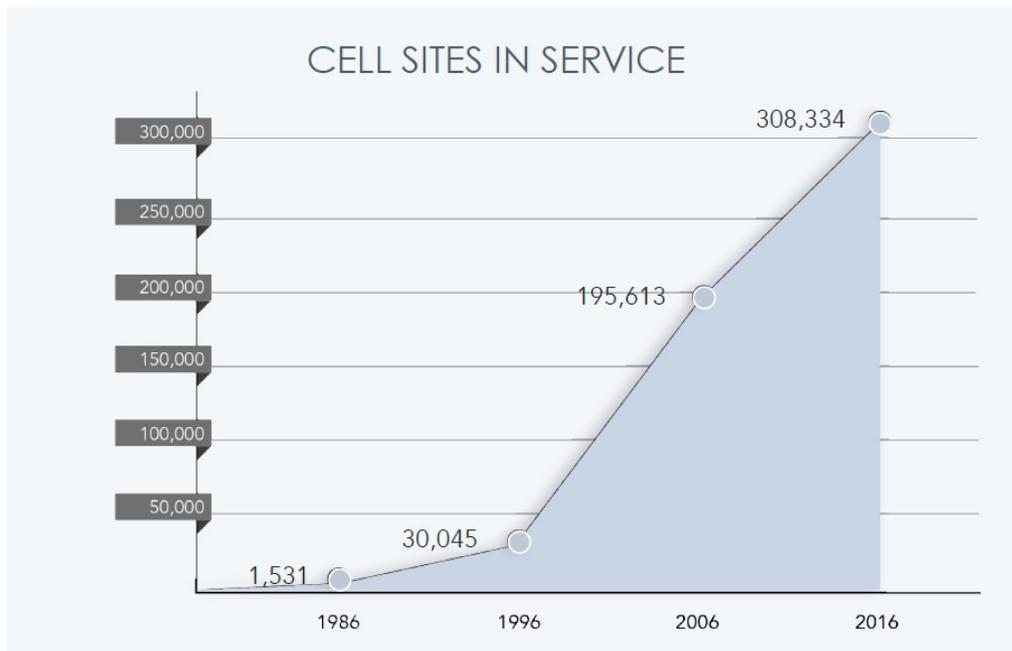
⁹ CTIA notes that the Commission is poised to consider the 20th Mobile Wireless Competition Report at its September 26, 2017 Open Meeting, the draft of which correctly concludes that the mobile wireless marketplace is effectively competitive. *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Twentieth Report*, WT Docket No. 17-69, FCC-CIRC1709-08 (rel. Sept. 7, 2017).

¹⁰ *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*, Sixth Broadband Deployment Report, 25 FCC Rcd 9556 ¶ 4 (2010) (“*2010 Report*”).

¹¹ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Thirteenth Report, 24 FCC Rcd 6185, ¶ 146, Table 10 (2009).

The cause of these remarkable results is clear: Over the past seven years, wireless providers collectively spent more than \$200 billion in network improvements to deliver 4G LTE mobile broadband.¹² This includes investments in cell site deployments. By the end of 2016, more than 308,000 sites were in service¹³—and that number is expected to increase dramatically with further development of small cells to create capacity for expanded 4G LTE and 5G networks. This investment does not, however, include expenditures on spectrum or related wireline or other third-party infrastructure; these investments add billions more to the total relevant capital expenditures made in order to further deployment.

Fig. 1¹⁴



¹² See, e.g., Comments of CTIA, WT Docket No. 17-69, at 28 (filed May 8, 2017) (“CTIA 2017 Competition Report Comments”); see also Letter from Scott K. Bergmann, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-69 (dated Sept. 19, 2017).

¹³ *Id.*; see also CTIA, *Wireless Snapshot 2017*, at 3 (May 2017), <https://www.ctia.org/docs/default-source/default-document-library/ctia-wireless-snapshot.pdf>.

¹⁴ *Id.*

As impressive as these figures are, data suggest that investment would have been even greater—and the expansion of coverage even broader—but for the chilling effect of the 2015 *Title II Order*.¹⁵ Yet, despite the drag of overly burdensome and unnecessary regulations, investment by companies providing mobile wireless broadband service still exceeded investment by companies in other capital-intensive industries. For example, AT&T’s network investments totaled nearly \$19 billion in 2015 and Verizon’s network investments totaled more than \$16 billion (including wireline and wireless spending),¹⁶ placing these two companies in the leading positions for non-financial companies in the U.S. and far exceeding the third-ranked company, ExxonMobil, which was responsible for less than \$11 billion in capital expenditures in 2015.¹⁷ The deployment of 5G will lead to further increases in investment, as wireless providers are projected to invest \$275 billion to build out 5G over the next decade.¹⁸

This expansion of deployment and intensive investment is clear evidence that the deployment of mobile broadband is reasonable and timely.

¹⁵ See, e.g., Comments of CTIA, GN Docket No. 17-108, at 25-26 (filed July 17, 2017) (noting that, among other data points and per a range of studies: (1) wireless capital investment per subscriber declined by 33 percent from 2014 to 2016; (2) capital expenditures by major ISPs declined by 8 percent from the first half of 2014 to the first half of 2015; and (3) between 2011 and 2015 the U.S. lost between \$150 and \$200 billion as a result of threatened or actual Title II reclassification); see also Reply Comments of CTIA, GN Docket No. 17-108 (filed Aug. 30, 2017).

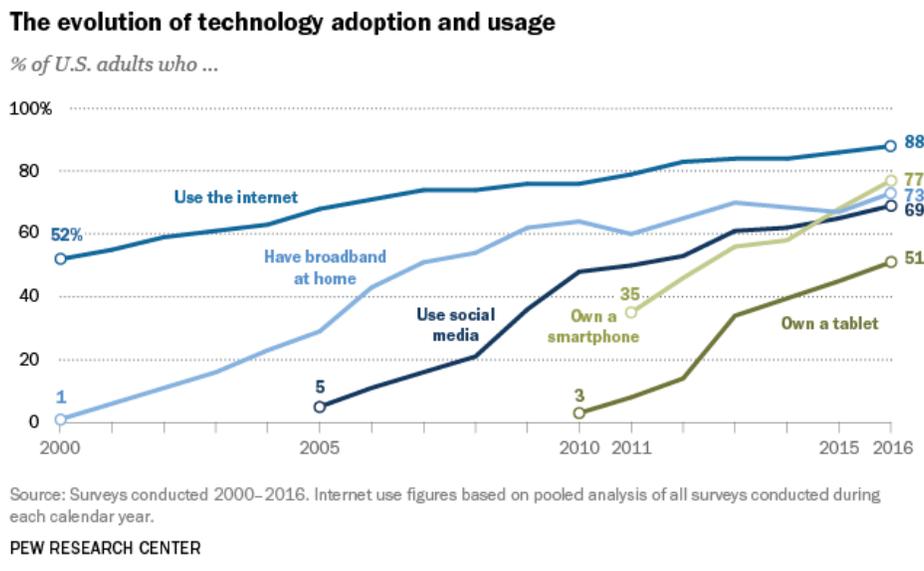
¹⁶ Michelle Di Ionna & Michael Mandel, *Investment Heroes 2016: Fighting Short-termism*, PROGRESSIVE POLICY INSTITUTE, at 5 (Oct. 2016), http://www.progressivepolicy.org/wp-content/uploads/2016/10/InvestHeroes_2016.pdf.

¹⁷ *Id.*

¹⁸ *Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities*, ACCENTURE STRATEGY, at 1 (2017), <https://www.ctia.org/docs/default-source/default-document-library/how-5g-can-help-municipalities-become-vibrant-smart-cities-accenture.pdf> (“*Smart Cities*”).

C. The Wireless Industry Continues to Innovate and Enable Mobile Wireless Broadband to Become a Central Part of American Consumers' Lives.

The reasonable and timely nature of broadband deployment also has allowed wireless services and devices to become the nerve center of consumers' daily lives. Nearly all American consumers today own a cellphone of some kind, with more than 80 percent owning smartphones¹⁹ and more than half owning a tablet that can leverage the myriad advantages of wireless connectivity.²⁰ Both numbers grew dramatically between 2010-2011, when the Pew Research Center reported that three percent of American adults owned tablets and 35 percent owned smartphones, to 2016, when Pew reported that 51 percent owned tablets and 77 percent owned smartphones.²¹



¹⁹ Adam Lella, *U.S. Smartphone Penetration Surpassed 80 Percent in 2016*, COMSCORE (Feb. 3, 2017), <https://www.comscore.com/Insights/Blog/US-Smartphone-Penetration-Surpassed-80-Percent-in-2016>.

²⁰ Ninety-five percent of American consumers own a cell phone of some kind. *Mobile Fact Sheet*, PEW RESEARCH CENTER (Jan. 12, 2017), <http://www.pewinternet.org/fact-sheet/mobile/>.

²¹ *Id.*; see also *The evolution of technology adoption and usage*, PEW RESEARCH CENTER (Jan. 11, 2017), http://www.pewresearch.org/fact-tank/2017/01/12/evolution-of-technology/ft_17-01-10_internetfactsheets/.

Reliance on wireless has become automatic and routine, so much so that 40 percent of consumers check their phones within the first five minutes of waking up,²² and the average U.S. consumer checks her phone nearly 50 times throughout the day.²³

Over the course of those 50-average checks, consumers are increasingly relying on wireless mobile broadband for a wide range of personal and professional uses. These include accessing employment opportunities, news, healthcare, home security services, transportation, public safety, entrepreneurship, education, and more.²⁴ As a result, wireless connectivity has become an important quality of life factor for many consumers. As one recent survey found, more Americans rank reliable wireless service as a “must have” than reasonable home prices or good commuting times.²⁵

²² *2016 Global Mobile Consumer Survey: US Edition*, DELOITTE (2016), <https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/global-mobile-consumer-survey-us-edition.html> (“2016 Global Mobile Consumer Survey: US Edition”).

²³ *Id.*

²⁴ *Wireless Connectivity Fuels Industry Growth and Innovation in Energy, Health, Public Safety, and Transportation*, DELOITTE, at 3 (Jan. 2017), https://www.ctia.org/docs/default-source/default-document-library/deloitte_20170119.pdf (“*Wireless Connectivity Fuels Industry Growth and Innovation*”); see also Kevin Ryan, *How Wireless Promotes Innovation Across Various Industries*, CTIA (Jan. 19, 2017), <https://www.ctia.org/industry-data/blog-details/blog-posts/how-wireless-promotes-innovation-across-various-industries>.

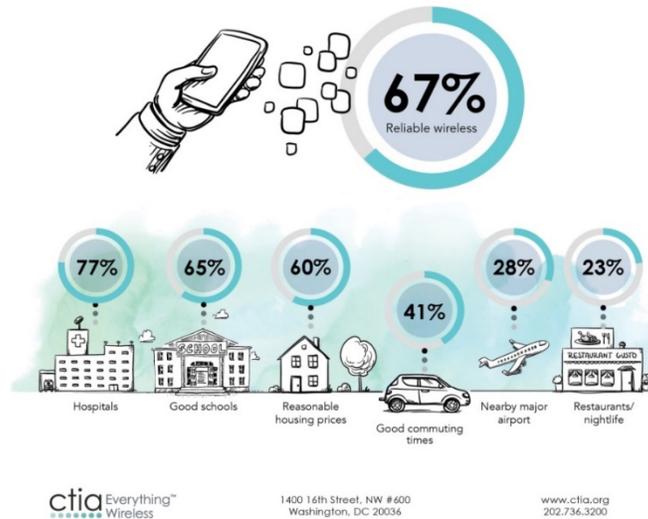
²⁵ CTIA 2017 Competition Report Comments at 10-11; see also *Consumers Value Wireless*, CTIA, <https://www.ctia.org/industry-data/facts-and-infographics-details/fact-and-infographics/consumers-value-wireless> (last visited Aug. 25, 2017).

Fig. 2

CONSUMERS VALUE WIRELESS

When moving to a new community, Americans believe reliable wireless is more of a must-have than good schools and affordable housing. **Here's how Americans rank the importance of reliable wireless compared to other neighborhood necessities.**

Source: Morning Consult 2017



Not surprisingly, usage of mobile data continues to rise. Americans used 13.72 trillion MB of data in 2016, 35 times more mobile data than in 2010.²⁶ On a per capita basis, Cisco reports U.S. mobile traffic was 4,172 MB in 2016, and projects it will rise to 18,030 MB by 2021. By contrast, Cisco reports global mobile data traffic per capita was 974 MB in 2016, and projects it will reach 6,247 MB by 2021. In Western Europe, global mobile data traffic per capita was 1,768 MB in 2016, and is projected to rise to 9,944 MB in 2021.²⁷ Mobile data usage is expected to continue to grow dramatically over the next five years as new network and device

²⁶ *Id.*

²⁷ Cisco VNI Mobile Forecast Highlights, 2016-2021, http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country (click on country, or region, and then “2021 Forecast Highlights”).

technologies respond to consumer demand for higher bandwidth services and faster connectivity. By 2021, Cisco projects mobile data traffic in the U.S. will grow five-fold from 2016—twice as fast as U.S. fixed Internet traffic. Indeed, mobile data traffic is already growing 1.9 times as fast as U.S. fixed Internet traffic.²⁸

Over the past three years, consumers have overwhelmingly embraced mobile apps, with time spent on them rising from 47 percent in December 2013, to account for 60 percent of all time consumers spend with *any* form of digital media as of December 2016—simultaneous with a 40 percent increase in total time spent on digital media.²⁹ Thus, mobile apps have a greater share of a much larger digital media universe. Mobile overall accounts for 69 percent of all time consumers spend with any form of digital media.³⁰

Mobile wireless broadband-based growth does not stop there; in addition to smartphones,³¹ consumers, businesses, and service providers are embracing tablets, wearables, and Internet of Things (“IoT”) devices to support new wireless functionalities, such as

²⁸ Cisco VNI Mobile Forecast Highlights, 2016-2021, http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country (click on “United States,” then “2021 Forecast Highlights,” and then “2016 Year in Review”).

²⁹ comScore, *2017 U.S. Cross Platform Future in Focus*, (March 22, 2017), downloadable from <https://www.comscore.com/Insights/Presentations-and-Whitepapers/2017/2017-US-Cross-Platform-Future-in-Focus>, at 5,7; see also Greg Sterling, *Mobile now accounts for nearly 70% of digital media time [comScore]*, MARKETING LAND (Mar. 29, 2017), <http://marketingland.com/mobile-now-accounts-nearly-70-digital-media-time-comscore-210094>.

³⁰ *Id.*

³¹ Even as consumers diversify their wireless device ownership by using wearables and other IoT devices, consumers rely on their wireless-powered smartphone as an information hub for a growing number of daily activities. In fact, Google Cloud—a service used to keep consumers’ wireless devices constantly in sync—ranked among the top ten peak period applications. See Sandvine, *2016 Global Internet Phenomena: Latin America & North America*, at 4 (June 21, 2016), <https://www.sandvine.com/downloads/general/global-internet-phenomena/2016/global-internet-phenomena-report-latin-america-and-north-america.pdf> (accounting for 3.56 percent of peak period aggregate traffic).

augmented and virtual reality and a range of healthcare applications.³² Many of the fastest growing mobile apps are services that improve daily life, such as hailing cabs, exercising, and dating. For example, the percentage of American adults that have used a dating app on their cellphone has tripled since 2013.³³

The “gig economy,” in which individuals seek and offer specific professional services using technology like apps, is also growing notably, as skilled workers, from local handymen to freelance computer programmers, use mobile apps and online services to take on project-based work in addition to, or even instead of, traditional employment. Nearly one in ten Americans earned money through an online job platform last year, and more than half of these users described “gig work” as essential or important to their lives.³⁴ And of course, many consumers continue to use their mobile phones for SMS/MMS text messaging (97 percent), voice/video calling (92 percent), Internet access (89 percent), and email access (88 percent).³⁵

The expanding availability and adoption of mobile broadband has benefitted consumers across all sectors of the economy, including low-income consumers and consumers with disabilities.³⁶ Low-income consumers have benefitted from innovations in wireless pricing plans, as late 2016 and early 2017 saw all four of the nation’s largest providers roll out unlimited

³² See *2016 Global Mobile Consumer Survey: US Edition* at 6.

³³ Aaron Smith, *15% of American Adults Have Used Online Dating Sites or Mobile Dating Apps*, PEW RESEARCH CENTER (Feb. 11, 2016), <http://www.pewinternet.org/2016/02/11/15-percent-of-american-adults-have-used-online-dating-sites-or-mobile-dating-apps/>.

³⁴ Aaron Smith, *Gig Work, Online Selling and Home Sharing*, PEW RESEARCH CENTER (Nov. 17, 2016), <http://www.pewinternet.org/2016/11/17/gig-work-online-selling-and-home-sharing/>.

³⁵ Aaron Smith, *Chapter Three: A “Week in the Life” Analysis of Smartphone Users*, PEW RESEARCH CENTER (Apr. 1 2015), <http://www.pewinternet.org/2015/04/01/chapter-three-a-week-in-the-life-analysis-of-smartphone-users/>.

³⁶ See CTIA 2017 Competition Report Comments at 19-20; Comments of CTIA, GN Docket No. 16-46, at 5-6 (filed May 24, 2017).

plans. Industry data show that the prices for wireless service are decreasing for consumers, even as consumers use more bandwidth and rely more on wireless connectivity. High-definition voice, transcription apps, and video chat capabilities are improving access for consumers who are deaf or hard of hearing.³⁷ Improved voice command and artificial intelligence (“AI”) platforms on mobile and home devices, including Amazon’s Alexa, Apple’s Siri, Google’s Assistant, and Microsoft’s Cortana, are also advancing access for consumers who are elderly, vision impaired, or mobility impaired.³⁸ On-going progress on location information technologies, such as mapping and navigation tools, provides new opportunities for individuals who are blind or low-vision to travel and navigate through their environments.³⁹ And nationwide and regional wireless service providers, along with wireless handset manufacturers, are working diligently to roll out real-time text (“RTT”) functionalities to provide a new text communications service for consumers with hearing and speech disabilities.

³⁷ Tom Avril, *Can’t Hear On Your Cellphone? Here’s Help*, PHILLY.COM (Mar. 3, 2017), <http://www.philly.com/philly/health/Cant-hear-on-your-cell-phone-due-to-hearing-loss-telecoil-hearing-aid.html>.

³⁸ See, e.g., Allen St. John, *Amazon Echo Voice Commands Offer Big Benefits to Users With Disabilities*, CONSUMER REPORTS (Jan. 20, 2017), <http://www.consumerreports.org/amazon/amazon-echo-voice-commands-offer-big-benefits-to-users-with-disabilities/> (available by subscription); see also The UK Department For International Trade, *This company taps the Internet of Things to give caregivers of the elderly peace of mind*, MASHABLE (Mar. 21, 2017), http://mashable.com/2017/03/21/howz/?utm_cid=mash-com-Tw-tech-link%23sd613jsnjld#6UG6wI2CeOqw.

³⁹ See, e.g., John Morris PhD, Mark Sweatman PhD, and Mike Jones PhD, Presentation at 32nd CSUN Assistive Technology Conference, *Smartphone Use and Activities by People with Disabilities: User Survey 2016*, Wireless RERC (2017), http://www.wirelessrerc.org/sites/default/files/publications/wireless_technology_activities_csun_2017-02-28.pdf (noting that 75 percent of individuals with a seeing disability who were polled in a 2015-2016 study used their phone for maps/GPS, compared to 67 percent in a 2012-2013 study).

Evidence of robust mobile broadband deployment comes not just from advances in how the private sector relies on mobile services, but also from government innovation in and around consumer mobile wireless broadband usage. For instance, government agencies are making their online content mobile-friendly and using apps, text-based alerts, and other mobile means to communicate with their constituents.⁴⁰ Some government agencies are taking even more concrete steps. For example, the Department of Veterans Affairs hosts its own mobile apps for veterans and also for health care professionals who care for them,⁴¹ and the Ohio Department of Education has launched a mobile app to allow people to locate neighborhood schools and review schools' report cards on their smartphones.⁴²

In short, consumers are using their mobile wireless services every day, everywhere, and every way to engage and support their communities, friends, family, and co-workers. This mobile-first way of life has revolutionized the way we live, work, and play—and it shows no signs of slowing. This is only possible because mobile wireless broadband deployment has been, and continues to be, reasonable and timely.

⁴⁰ See, e.g., U.S. Department of Health and Human Services, Mobile, <https://www.hhs.gov/web/building-and-managing-websites/mobile/index.html> (last visited Sept. 6, 2017) (“HHS has been moving toward writing content on websites that keeps mobile in mind and are exploring different ways to reach audiences through mobile devices.”).

⁴¹ U.S. Department of Veterans Affairs, VA App Store, <https://mobile.va.gov/appstore/> (last visited Sept. 6, 2017).

⁴² Press Release, Ohio Department of Education, Ohio Department of Education Launches Mobile App (Dec. 6, 2016), <http://education.ohio.gov/Media/Media-Releases/2016-Media-Releases/Ohio-Department-of-Education-Launches-Mobile-App#.WamuA3mouck>.

D. The Rapid Growth in the Internet of Things Is Supported by the Reasonable and Timely Deployment of Mobile Wireless Broadband Services.

The ever-progressing reasonable and timely deployment of mobile broadband networks also has led to the unprecedented growth of IoT.⁴³ Billions of Internet-connected devices already are in the marketplace, yet we are only at the dawn of the IoT era. Gartner predicts that there will be 8.4 billion connected devices globally in 2017—up 31 percent from nearly 6.4 billion in 2016—and 20.4 billion IoT devices by 2020.⁴⁴ This predicted innovation is only possible because of the progress *already* made in the deployment of mobile wireless broadband.

IoT devices range from consumer-oriented products such as wearables, connected cars, and smart home devices to large interconnected manufacturing systems. While consumer IoT devices currently drive the IoT market, representing 63 percent of the overall applications in use in 2017, businesses are expected to soon spend the most on IoT applications.⁴⁵ According to Gartner, based on predicted hardware spending in 2017, businesses' IoT usage will amount to \$965 billion, compared to \$725 billion from consumer applications.⁴⁶ By 2020, hardware spending is expected to reach almost \$3 trillion from consumers and businesses combined.⁴⁷

⁴³ See, e.g., Cisco *Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021*, at 1-3, 16-17 (Mar. 28, 2017), <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf>; Press Release, Gartner Inc., Gartner Says 8.4 Billion Connected “Things” Will Be in Use in 2017, Up 31 Percent From 2016 (Feb. 7, 2017), <http://www.gartner.com/newsroom/id/3598917> (“Gartner IoT Release”).

⁴⁴ Gartner IoT Release.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

Business use cases for connected IoT devices include fleet management,⁴⁸ unmanned aviation,⁴⁹ and remote inspections and diagnostics.⁵⁰

This estimated growth is grounded in significant part in the fact that wireless providers already market IoT connectivity and offer plans to support this functionality. For example, earlier this year, T-Mobile began marketing IoT connectivity to companies creating IoT applications, offering data plans styled as “IoT Access Packs.”⁵¹ In 2015, Verizon launched an IoT developer program and self-service webpage called ThingSpace. ThingSpace lets developers connect up to three devices for 90 days and select from a range of modules. More than 16,000 developers have used ThingSpace to date.⁵² In 2016, AT&T introduced IoT data plans meant to help businesses and developers quickly get their products off the ground.⁵³ And in July 2016, AT&T started selling an IoT Starter Kit that includes a SIM card with 300 MB of prepaid data service, an LTE modem, a development board with a variety of sensors, cloud

⁴⁸ See Satish Ram, *Six Steps to Harnessing IoT to Transform Your Cold Chain Fleet*, MANUFACTURING BUS. TECH. (Apr. 26, 2017), <http://www.mbtmag.com/article/2017/04/six-steps-harnessing-iot-transform-your-cold-chain-fleet>.

⁴⁹ See Scott Allen, *FHSS and the Industrial Internet of Things*, TECHTARGET (Apr. 24, 2017), <http://internetofthingsagenda.techtarget.com/blog/IoT-Agenda/FHSS-and-the-industrial-internet-of-things>.

⁵⁰ See Mike Bacidore, *Automotive Parts Supplier Launches IIOT Initiative*, CONTROL DESIGN (Jan. 30, 2017), <http://www.controldesign.com/articles/2017/automotive-parts-supplier-launches-iiot-initiative/> (highlighting an auto parts supplier that will use new technology to create an IoT production line and “enable remote equipment monitoring and management from a centralized dashboard to promote predictive and proactive maintenance”).

⁵¹ Press Release, T-Mobile, T-Mobile Delivers Simplicity to the Internet of Things (Jan. 3, 2017), <https://newsroom.t-mobile.com/news-and-blogs/iot-access-packs.htm>.

⁵² See Internet of Things, Verizon, <http://www.verizon.com/about/our-company/internet-things> (last visited Aug. 31, 2017).

⁵³ IoT Data Plans and SIMs for Effortless Connectivity, AT&T, <https://marketplace.att.com/iot-connectivity> (last visited Aug. 31, 2017).

storage, and access to the company's Flow, a web-based development environment for creating IoT apps.⁵⁴

The development of 5G will further expand the use of wireless and IoT devices to support a multitude of diverse industries, including energy, health, public safety, and transportation.⁵⁵ It is on the back of reasonable and timely deployment of mobile wireless broadband services that 5G is projected to contribute \$500 billion to the U.S. economy, and to create up to three million new jobs.⁵⁶

III. THE COMMISSION SHOULD CONSIDER AVAILABLE DATA, RATHER THAN ESTABLISH ARBITRARY BENCHMARKS, TO DETERMINE THAT MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.

As scholar Mark Jamison recently noted, “Who knows what broadband is? Customers.”⁵⁷ Jamison noted that the Commission can best fulfill its mandate under Section 706 by “watching what customers do.”⁵⁸ As the data discussed below reveal, consumers have voted with their wallets firmly in support of the timely efforts industry has made to bring mobile wireless broadband to the American people. Thus, a consumer-focused approach to assessing

⁵⁴ The Starter Kit for IoT Innovation, AT&T, <https://marketplace.att.com/iot-starter-kits> (last visited Aug. 31, 2017); IoT Starter Kit, AT&T Business, <https://www.business.att.com/enterprise/Service/internet-of-things/iot-platforms-development/starter-kit/> (last visited Aug. 31, 2017).

⁵⁵ See generally *Wireless Connectivity Fuels Industry Growth and Innovation*; see also Kevin Ryan, *How Wireless Promotes Innovation Across Various Industries*, CTIA (Jan. 19, 2017), <https://www.ctia.org/industry-data/blog-details/blog-posts/how-wireless-promotes-innovation-across-various-industries>.

⁵⁶ Jamie Hastings, *How Smart Wireless Policies Will Unlock Smart Cities and Grow Our Country's Economy*, CTIA (Jan. 13, 2017), <https://www.ctia.org/industry-data/blog-details/blog-posts/smart-wireless-policies-unlock-smart-cities-grow-economy>; see also Smart Cities at 1.

⁵⁷ Mark Jamison, *Let Customers Benchmark Broadband*, Am. Enterprise Inst. (Aug. 23, 2017), <https://www.aei.org/publication/let-customers-benchmark-broadband/>.

⁵⁸ *Id.*

the reasonableness and timeliness of mobile broadband deployment yields more accurate results than reliance on arbitrary, rigid benchmarks.

A. Rigid Benchmarks Are Not Suitable to Measure Ever-Evolving Mobile Wireless Broadband Services Across the Diverse U.S. Market.

In past reports, the Commission often used ever-increasing, specific benchmarks as a means of reaching artificial negative findings about the reasonableness and timeliness of broadband deployment.⁵⁹ However, rigid benchmarks are not suitable for the Commission to determine whether mobile wireless broadband deployment is reasonable and timely. As the *2016 Report* noted, “mobile transmissions are subject to environmental factors that fixed line transmissions do not encounter”⁶⁰—indeed, mobile transmissions “encounter[] degrading effects from factors such as congestion, interference, and challenges presented by the physical velocity of the mobile antenna.”⁶¹ As a result of these and other factors, it is difficult to set rigid benchmarks against which to judge mobile wireless broadband networks.⁶²

In particular, and as CTIA has argued in response to past Commission inquiries ultimately leading to prior Section 706 reports, latency and consistency of service are

⁵⁹ For example, in 2015 the Commission increased the benchmark for fixed broadband from 4/1 to 25/3. *2015 Report*, 30 FCC Rcd 1375, 1394 ¶ 27 (2015). It had increased the benchmark to 4/1 in 2010. *2010 Report*, 25 FCC Rcd 9556, 9559-64 ¶¶ 5-10 (2010).

⁶⁰ *2016 Report* ¶ 29.

⁶¹ *Id.* ¶ 61.

⁶² The Commission’s Mobility Fund Phase II (MF-II) benchmarks for area eligibility (*i.e.*, 5 mbps download) and build-out standards (*i.e.*, 10 mbps download and 1 mbps upload) address a very different question from the Section 706 inquiry. The Commissions’ MF-II benchmarks establish criteria to distribute scarce federal universal service fund dollars, while Section 706 simply asks whether broadband deployment is reasonable and timely. As a result, the Mobility Fund Phase II benchmarks should not inform this inquiry. *See NOI* ¶ 20.

challenging to measure in the mobile environment.⁶³ Moreover, there is no evidence that the nominal amount of latency inherent in today’s advanced mobile networks is affecting consumers. The vast majority of all Internet traffic is comprised of functions—video streaming, downloading, and web browsing—that are less affected by latency. Indeed, according to Cisco’s data for 2016, 64 percent of U.S. mobile data traffic is comprised of video.⁶⁴ Advertising in the broadband marketplace also shows that latency is not a significantly important feature for consumers—instead, providers’ advertising emphasizes characteristics of importance to consumers, including primarily speed and price.⁶⁵

B. The Innovative Offerings Described Herein and Data on Consumer Satisfaction Show That Mobile Wireless Broadband Deployment Is Meeting and Exceeding Consumers’ Demands.

The overwhelming evidence of the rapid and consumer-satisfying pace of mobile wireless broadband deployment makes clear that an affirmative finding under Section 706 is the most logical conclusion. As discussed above, mobile wireless broadband networks are being

⁶³ See, e.g., Comments of CTIA – The Wireless Association, GN Docket No. 15-191, at 7-8 (filed Sept. 15, 2015) (“CTIA 2015 Comments”); Comments of CTIA, GN Docket No. 16-245, at 24-26 (filed Sept. 17, 2016).

⁶⁴ *Mobile Forecast Highlights, 2016-2021*, CISCO (Mar. 28, 2017), https://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/#~CountryVNI (“Video will be 76% of the United States’s mobile data traffic by 2021, compared to 64% at the end of 2016. Video reached half of the United States’s mobile data traffic by year-end 2015 or earlier.”).

⁶⁵ See, e.g., *Wireless*, AT&T, <https://www.att.com/wireless/> (last visited Aug. 26, 2017) (advertising AT&T’s network as the “nation’s best data network” on the basis of Nielsen testing, which emphasizes speed as its first “critical industry metric[.]”) (quoting *Network Performance*, Nielsen, <http://www.nielsen.com/us/en/solutions/capabilities/nielsen-mobile-performance.html> (last visited Aug. 26, 2017)); *Welcome to America’s Best Unlimited Network*, T-Mobile, https://www.t-mobile.com/coverage/4g-lte-network?icid=WMM_TM_Q217EVERGR_F41Y97WH90H8419 (last visited Aug. 25, 2017) (advertising for T-Mobile’s service on the basis of its “lightning-fast network”); *Unlimited for All*, Verizon, <https://www.verizonwireless.com/plans/verizon-plan/> (last visited Aug. 25, 2017) (advertising for Verizon on the basis of its network’s data capacity, and not consumer latency experiences when using said network).

deployed more widely than ever before, and consumers are increasing their reliance on these networks. Further, service providers are creating new and innovative offerings to meet consumer demand for mobile wireless broadband. For example, wireless providers, cable Internet Service Providers (“ISPs”), and new market entrants are all introducing and announcing new service plans that bundle mobile wireless and Wi-Fi services to meet consumer demand.⁶⁶ More directly, these innovative offerings demonstrate the limiting effect that arbitrary definitions of mobile wireless broadband could have on the Commission’s Section 706 analysis.

The Commission’s Section 706 analysis should more appropriately focus on whether offered services are meeting consumer demand and expectations. To this point, the data also show that consumer satisfaction in mobile wireless broadband networks is high and increasing. For instance, Consumer Reports’ most recent ranking reports that the customers of surveyed mobile carriers were “very satisfied” or “fairly well satisfied,”⁶⁷ while the American Customer Satisfaction Index shows that wireless consumer satisfaction has increased since 2009 and

⁶⁶ See Press Release, Comcast, Comcast Introduces Xfinity Mobile: Combining America’s Largest, Most Reliable 4G LTE Network and the Largest Wi-Fi Network (Apr. 6, 2017), <http://corporate.comcast.com/news-information/news-feed/comcast-xfinity-mobile>; Chad Bray, *Comcast and Charter Communications Forge Wireless Alliance*, NY TIMES (May 8, 2017), https://www.nytimes.com/2017/05/08/business/dealbook/comcast-charter-communications-deal.html?mcubz=1&_r=0; AT&T, Wi-Fi Calling, <https://www.att.com/shop/wireless/features/wifi-calling.html>; Verizon, Wi-Fi Calling FAQs, <https://www.verizonwireless.com/support/wifi-calling-faqs/>; T-Mobile, Wi-Fi Calling, <https://support.t-mobile.com/docs/DOC-1680>; Sprint, Wi-Fi Calling FAQs, <https://www.sprint.com/en/support/solutions/services/faqs-about-wi-fi-calling.html>; Republic Wireless, Wi-Fi Calling, <https://republicwireless.com/wifi-calling/>; Segan, Sasha, *Republic Wireless Ups Phone and Network Options*, PC MAGAZINE (May 11, 2016), <https://www.pcmag.com/news/344349/republic-wireless-ups-phone-and-network-options> (last visited Sept. 6, 2017); Google, Wi-Fi Connections and Calls, <https://fi.google.com/about/faq/#wifi-connection-and-calls-5> (last visited Sept. 6, 2017).

⁶⁷ See *Find Cell Phones and Mobile Services with the Features Most Important to You!*, CONSUMER REPORTS, <https://www.consumerreports.org/products/us-cell-phone-carriers/ratings-overview/> (last visited Aug. 26, 2017) (subscription required to access report).

remains high.⁶⁸ In sum, mobile wireless broadband networks are expanding consistently and meeting or exceeding consumer demands and expectations, which is a basis for determining that mobile wireless broadband deployment is both reasonable and timely.

IV. TO ENSURE MOBILE WIRELESS BROADBAND DEPLOYMENT REMAINS REASONABLE AND TIMELY, THE COMMISSION SHOULD STRIKE THE RIGHT BALANCE IN ITS REGULATORY POLICIES.

Despite the above-described deployment successes, further progress in the reasonable and timely deployment of mobile broadband will be contingent upon a conducive regulatory environment. Accordingly, the Commission should consider and act upon the following recommendations.

A. Allocating More Low-, Mid-, and High-Band Spectrum for Exclusive Licensed Use Remains Critical to Continued Reasonable and Timely Deployment of Mobile Broadband.

The Commission, National Telecommunications and Information Administration, and other agencies have done important work in the last few years to make spectrum available for mobile broadband. The AWS-3 auction and 600 MHz incentive auction were particular successes. There remains, however, an urgent need for additional spectrum to meet today's ever-growing consumer demand, and 5G networks will only intensify the need for more spectrum resources to ensure the continued reasonable and timely deployment of mobile broadband networks.

Therefore, in order to ensure continued reasonable and timely mobile broadband deployment, CTIA urges the Commission to (1) complete the 600 MHz transition on a timely

⁶⁸ See *ACSI Telecommunications Report 2017*, AM. CONSUMER SATISFACTION INDEX (May 23, 2017), <http://www.theacsi.org/news-and-resources/customer-satisfaction-reports/reports-2017/acsi-telecommunications-report-2017>.

basis;⁶⁹ (2) finalize the Spectrum Frontiers proceeding, including by auctioning the 28 GHz and 37/39 GHz bands and making available at least 15 GHz of additional high band spectrum for terrestrial mobile use;⁷⁰ (3) issue a Notice of Proposed Rulemaking and adopt CTIA proposals to promote investment and innovation in the 3.5 GHz band;⁷¹ and (4) move forward with identifying spectrum between 3.7 GHz and 24 GHz as part of the Commission’s pending Mid-Band Notice of Inquiry and, ultimately, the companion rulemaking proceeding.⁷²

B. The Commission Should Modernize its Siting Policies to Advance the Deployment of Wireless Infrastructure.

Ensuring that mobile broadband continues to be deployed in a reasonable and timely fashion also requires massive investment in deploying the networks that can support broadband services, including hundreds of thousands of small cell facilities. Yet, at the very time that investment is urgently needed, many federal, state, local, and Tribal siting requirements hamper such financial inflows. The Commission has wisely begun proceedings to determine whether and how to update its rules to reflect the changing nature of mobile broadband infrastructure

⁶⁹ See, e.g., Testimony of Scott K. Bergmann, Vice President, Regulatory Affairs, CTIA, on The Broadcast Incentive Auction: Update on Repacking Opportunities and Challenges, before the U.S. House Committee on Energy and Commerce Subcommittee on Communications and Technology (Sept. 7, 2017), <http://docs.house.gov/meetings/IF/IF16/20170907/106373/HHRG-115-IF16-Wstate-BergmannS-20170907-U11.pdf>; CTIA Opposition to Petition for Reconsideration of NAB, GN Docket No. 12-268, MB Docket No. 16-306, at 2-3 (filed Apr. 26, 2017) (emphasizing that the current “post-auction transition plan for the 600 MHz band ... is essential to delivering ... economic benefits and meeting consumer demand” and urging the Commission to deny requests which would “serve to delay the post-auction transition” and instead “ensure a timely transition of the 600 MHz band”).

⁷⁰ See Letter from Scott K. Bergmann, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed July 14, 2017).

⁷¹ See Petition for Rulemaking of CTIA, GN Docket No. 12-354, RM-11788 (filed June 16, 2017).

⁷² See generally *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183, Notice of Inquiry, 32 FCC Rcd 6373 (2017).

needs.⁷³ CTIA fully supports the Commission’s efforts, and urges it to take the following targeted actions to address these barriers.⁷⁴

Reduce delays. The Commission should adopt shorter “shot clock” time periods for localities to act on siting applications—specifically, 60 days for collocation applications and 90 days for applications for new construction. It also should broaden the “deemed granted” remedy to provide applicants with a viable path to deployment that does not involve years of litigation and delay. Further, the Commission should clarify that all local approval procedures must be completed within the shot clock timeframe. These actions will give the Commission’s shot clocks the remedies necessary to achieve their underlying purpose of facilitating an efficient local siting process.

Reduce Barriers. The Commission should clarify that Section 253 of the Communications Act (“Act”) prohibits laws and practices that impose substantial or discriminatory barriers that limit providers from competing in a fair and balanced regulatory environment. It should also declare that certain types of siting laws and regulations prohibit or have the effect of prohibiting broadband deployment and violate Sections 253 and 332 of the Act, including, among others, express and *de facto* moratoria; denial of access to municipally

⁷³ *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Notice of Proposed Rulemaking, Notice of Proposed Rulemaking and Notice of Inquiry, 32 FCC Rcd 3330 (2017); *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, Notice of Proposed Rulemaking, Notice of Inquiry and Request for Comment, 32 FCC Rcd 3266 (2017); *see also Comment Sought on Streamlining Deployment of Small Cell Infrastructure by Improving Wireless Facilities Siting Policies*, Public Notice, 32 FCC Rcd 13360 (WTB 2017).

⁷⁴ *See* Comments of CTIA, WT Docket No. 17-79, WC Docket No. 17-84 (filed June 15, 2017); Reply Comments of CTIA, WT Docket No. 17-79, WC Docket No. 17-84 (filed July 17, 2017); Joint Comments of CTIA and the Wireless Infrastructure Association, WT Docket No. 17-79 (filed June 15, 2017); Joint Reply Comments of CTIA and the Wireless Infrastructure Association, WT Docket No. 17-79 (filed July 17, 2017).

owned poles and rights of way; undergrounding mandates; requirements that providers prove a need for each facility or technology; and network design and unbounded subjective aesthetic requirements.

Reduce fees. The Commission should interpret Sections 253 and 332 of the Act to limit a locality's application and/or permit fees, as well as other siting fees for installing wireless facilities in rights of way, to the locality's actual, direct costs to review applications, issue permits, and manage rights of way, and require that all fees be published, and be competitively neutral and nondiscriminatory.

Modernize environmental and historic processing requirements. The Commission should broaden the exclusions for wireless facilities and collocations in its rules implementing the National Environmental Policy Act ("NEPA") and the National Historic Preservation Act ("NHPA"). Specifically, it should exclude the support poles associated with all small wireless facility deployments from NEPA review; modify the rule that requires Environmental Assessments for all sites in floodplains; and exclude from NHPA Section 106 review five types of wireless facilities that are unlikely to affect historic properties (*i.e.*, pole replacements; small cells that are more than 50 feet from the boundary of a historic district or located on structures that previously received local approval; facilities located in transportation rights of way; all indoor wireless facilities; and collocations that involve either no ground disturbance or no new ground disturbance and that do not substantially increase the structure's size).

For applications for facilities to be sited on *non-Tribal* lands that remain subject to the Section 106 Tribal consultation review process, the Commission should improve the efficacy and efficiency of Tribal consultation. Specifically, it should (1) clarify that, for projects located on non-Tribal lands, Tribes serve as consulting parties and may not charge fees for their

participation; (2) establish a rebuttable presumption that the information contained in the Preliminary FCC Form 620/621 Submission Packet contains sufficient information for Tribes to ascertain whether a historic property may be affected; (3) set finite timelines for concluding consultation; (4) reform to the Tower Construction Notification System; and (5) set guideposts for monitoring wireless infrastructure construction.

Finally, the Commission should resolve the longstanding concerns surrounding so-called “Twilight Towers” (*i.e.*, towers built between March 16, 2001 and March 7, 2005) by finding those towers exempt from the consultation process based upon previous changes in the Commission’s rules.

C. The Commission Should Remove Burdensome Title II Requirements that Create Regulatory Barriers to Wireless Network Deployment.

In order to ensure the continued reasonable and timely deployment of mobile wireless broadband networks, the Commission also should reverse the *Title II Order*’s determination that broadband is a telecommunications service and rescind the harmful regulations made in that decision. CTIA and its member companies are committed to Internet openness, but a free and open Internet is not synonymous with Title II regulation. As CTIA has observed, imposing Title II requirements on broadband providers has undermined wireless network deployment.⁷⁵ As compelling as the data in these comments show mobile network deployment to have been, such deployment would have been more extensive without the burden and uncertainty of the *Title II Order*.⁷⁶ For example, wireless capital investment per subscriber declined by 33 percent from 2014 to 2016, capital expenditures by major Internet service providers declined by eight percent

⁷⁵ See Comments of CTIA, GN Docket No. 17-108 (filed July 17, 2017); Reply Comments of CTIA, GN Docket No. 17-108 (filed Aug. 30, 2017).

⁷⁶ See *supra* note 15.

from the first half of 2014 to the first half of 2015, and between 2011 and 2015 the U.S. lost between \$150 and \$200 billion as a result of threatened or actual Title II reclassification.⁷⁷

To promote the investment and innovation that maintain Internet openness, the Commission should reverse the *Title II Order* and return to the long-standing, bipartisan Title I consensus that for many years enabled a vibrant, competitive mobile wireless market to deliver the services and access consumers demand, and Congress should establish rules to support clear, lasting, and reasonable protections that protect and promote Internet freedom, customer-focused innovation, and network investment.

D. The Commission Should Move Forward With Mobility Fund Support for Unserved Rural Areas.

CTIA commends the Commission’s work to move towards implementation of Mobility Fund Phase II (“MF-II”) as an effective means of helping to ensure that mobile broadband deployment remains reasonable and timely. Implementing a robust and efficient Mobility Fund will enable wireless providers to serve rural and high-cost areas where consumers lack access to critical mobile wireless broadband services. Despite all of the evidence about the extensive deployment of mobile broadband networks discussed above, many rural areas remain unserved by 4G LTE services. For example, a 2016 Wireless Bureau analysis showed that, based on Form 477 data, one-fifth of the area of the U.S. has no LTE coverage or only subsidized coverage—including locations where more than three million people live.⁷⁸ In such areas, targeted universal service support such as MF-II can play a critical role in ensuring that all Americans have

⁷⁷ Comments of CTIA, GN Docket No. 17-108, at 25-26 (filed July 17, 2017).

⁷⁸ FCC WTB, *Working Toward Mobility Fund II: Mobile Broadband Coverage Data and Analysis*, at 15 ¶ 28 (2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-341539A1.pdf.

reasonably comparable access to mobile broadband services. For this reason, CTIA encourages the Commission to continue making timely progress on implementation of MF-II.

V. CONCLUSION.

Using any rational benchmark, the deployment of mobile broadband has been and continues to be reasonable and timely, and the Commission's next report should so conclude. The Commission can help ensure that the reasonable and timely deployment of mobile wireless broadband continues through targeted, balanced regulatory action in specific areas.

Respectfully submitted,

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