Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion	)	GN Docket No. 20-269
	)	
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COMMENTS OF CTIA

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CTIA[1] respectfully submits these comments in response to the Federal Communications Commission's (Commission's) *Sixteenth Broadband Deployment Report Notice of Inquiry*.[2] Mobile broadband networks continue to expand throughout the United States, reaching more communities and delivering more advanced services to benefit consumers than before—particularly as changes to the way we live, work, and learn make mobile broadband connectivity more important than ever. For these and other reasons discussed below, the Commission should find that the deployment of mobile broadband services continues to be reasonable and timely, and take steps to promote access to the resources providers need to support the services that consumers increasingly demand.

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[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.

[2] *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Sixteenth Broadband Deployment Report Notice of Inquiry, GN Docket No. 20-269, FCC 20-112 (rel. Aug. 19, 2020) (*Sixteenth Report NOI*).

I. INTRODUCTION AND SUMMARY.

Mobile broadband access is more important to American consumers now than ever. Responding to consumer demand, the wireless industry continues to invest in and deploy advanced networks to communities throughout America—investing a four-year high of $29.1 billion, adding more cell sites than the preceding three years combined, and deploying 5G covering more than 200 million people and more than 5,000 cities and towns across the United States by the end of 2019.[3] Subsequently, coverage has expanded to more than 250 million people living in more than 7,500 towns, cities, and other communities.[4] As the U.S. led the world in 4G LTE over the past decade, our nation's transition to 5G is expanding the capacity and reach of mobile wireless networks, and creating millions of jobs, substantial economic growth, remarkable investment and usage, and consumer benefits in communities across the country. While hard work from industry and policymakers remains necessary to ensure that mobile broadband services are available to all consumers, particularly as a result of the unprecedented COVID-19 pandemic, the data provided in these comments demonstrate that the Commission should find that mobile wireless broadband is being deployed on a reasonable and timely basis pursuant to Section 706 of the Telecommunications Act of 1996.[5]

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[3] *Id.* at 3.

[4] *Already Nationwide, T-Mobile Supercharges 5G Speeds for Millions More People in Over 80 New Cities & Towns,* T-MOBILE (Sept. 2, 2020), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/Already-Nationwide-T-Mobile-Supercharges-5G-Speeds-for-Millions-More-People-in-Over-80-New-Cities--Towns/default.aspx; *T-Mobile Launches World's First Nationwide Standalone 5G Network*, T-MOBILE (Aug. 4, 2020), https://www.t-mobile.com/news/network/standalone-5g-launch.

[5] Section 706 of the Telecommunications Act of 1996 is now codified at 47 U.S.C. § 1302(b); *see also Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2019 Broadband Deployment Report, 34 FCC Rcd 3857, 3896-99 ¶¶ 76-79 (2019) (*Fourteenth Report*) (finding "advanced telecommunications

Today, most consumers have a mobile device within arm's reach and the ability to connect to almost anyone and anything through high-speed mobile broadband services. In fact, nearly 96 percent of U.S. adults own a mobile phone of some kind, and the percentage of those consumers with a smartphone has nearly tripled over the past decade.[6] Over the past year, mobile broadband has gained an even more central role in the way American consumers live, work, and play, as mobile data use last year exceeded 37.06 trillion MBs—representing 30 percent year-over-year growth, or 96 *times* more data used in 2019 than in 2010.[7] The number of wireless subscriptions grew more than 20 million year-over-year, reaching 442.5 million in 2019, and data-only devices, like connected cars and smartwatches, reached nearly 175 million last year.[8] Tellingly, the additional 8.5 trillion MBs added last year alone is 43 percent more data than the industry's first four years of data traffic *combined*.[9]

Wireless providers' investment and deployment efforts laid the foundation for the industry's response to COVID-19, a crisis that is reinforcing the critical importance of wireless connectivity and has further challenged the industry to maintain advanced networks that meet the ever-increasing data needs of American consumers. To date, the wireless industry has responded by handling unprecedented surges in mobile voice and data traffic driven by sudden shifts in typical mobile traffic patterns, and creating new service offerings to enable students to keep

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capability is being deployed to all Americans in a reasonable and timely fashion").

[6] *See* Mobile Factsheet, PEW RESEARCH CTR. (June 12, 2019), https://www.pewresearch.org/internet/fact-sheet/mobile/; CTIA, *2020 Annual Survey Highlights*, CTIA (Aug. 25, 2020), https://api.ctia.org/wp-content/uploads/2020/08/2020-Annual-Survey-final.pdf (*2020 Annual Survey Highlights*).

[7] *2020 Annual Survey Highlights* at 8.

[8] *Id.* at 8.

[9] *Id* at 7.

learning, doctors and nurses to keep people healthy, and workers connected to their jobs.[10] Rapid action by policymakers, including the Commission, has also enabled wireless providers to quickly add capacity and maintain or create new connections for low-income consumers and consumers relying on remote healthcare.

To ensure that mobile broadband deployment remains reasonable and timely, the Commission should continue its pro-deployment approach and build upon the positive steps it has already taken. The Commission has also worked steadily to remove unnecessary barriers to mobile broadband deployment by modernizing its wireless facility siting policies, and providing the wireless industry with spectrum resources to keep driving investment and deployment. CTIA commends the steady progress the Commission has made to provide flexible-use licenses in low-, mid-, and high-band spectrum, which are central to U.S. 5G success. To further promote deployment and U.S. leadership in the race to 5G, CTIA urges the Commission to adopt and support policies that increase access to additional spectrum resources, particularly mid-band spectrum for exclusive licensed use, continue to streamline its rules to facilitate access to existing wireless infrastructure, and provide incentives, support, and other resources to support mobile broadband deployment.

Given that more consumers than ever have access to mobile wireless broadband services that support ever-increasing consumer demand and increased use across all metrics—even in the face of unprecedented challenges—while also driving the development of a new 5G economy, the Commission should again find that mobile wireless broadband is being reasonably and timely

[10] CTIA, *How Wireless Kept Americans Connected During COVID-19*, at 3–4 (June 23, 2020) (noting that voice traffic and texting increased 20-40 percent, and mobile data traffic rose nearly 20 percent during the pandemic), https://api.ctia.org/wp-content/uploads/2020/06/How-Wireless-Kept-Americans-Connected-During-COVID-19-2.pdf (*COVID-19 Wireless Connectivity Study*).

deployed. By maintaining policies that ensure wireless providers have access to spectrum, infrastructure, and other resources necessary for deployment, the Commission can promote the wireless industry's ability to continue progress towards serving all Americans with the mobile services that are increasingly central to their daily lives.

II. ALL DATA DEMONSTRATE THAT MOBILE WIRELESS BROADBAND IS BEING DEPLOYED ON A REASONABLE AND TIMELY BASIS.

A. The Commission's Focus on Progress in Deployment is Consistent with Section 706 of the Telecommunications Act of 1996.

Consistent with past years, the Commission is right to focus its Section 706 examination once again on whether *progress* in the deployment of advanced telecommunications capability is reasonable and timely. Congress charged the Commission to report on an annual basis "whether advanced telecommunications capability *is being deployed* to all Americans in a reasonably timely fashion."[11] As the Commission has previously noted, use of the present progressive tense in Section 706 (*i.e.*, "is being deployed") to define the annual reporting requirement indicates that Congress intended for the Commission to report on the ongoing *progress* of deployment.[12] Were it Congress's intent to seek Commission input on whether deployment to all Americans *has been achieved*, Congress easily could have done so by directing the Commission to report on whether telecommunications capability "*has* been deployed" in a reasonable and timely fashion—and Congress did not do so.[13]

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[11] 47 U.S.C. § 1302(b) (emphasis added).

[12] *2020 Broadband Report* ¶ 8 (citing 2018 Report, 33 FCC Rcd at 1663, para. 11; see also 2019 Report, 34 FCC Rcd at 3859-60, para. 8 (finding that use of a progress-based approach enables the Commission to conduct the section 706 inquiry in the manner the statute requires)).

[13] *See, e.g.*, *Dole Food Co. v. Patrickson*, 538 U.S. 468, 478 (2003) (interpretation "require[d]" by the "plain text of [the] provision" in question predicated on tense-usage by Congress); *Ingalls Shipbuilding v. Dir., Office of Workers' Comp. Programs*, 519 U.S. 248, 255 (1997) ("[P]lain

CTIA therefore agrees with the Commission's proposal in the *Sixteenth Report NOI* that the agency conduct this inquiry, as it has done in recent years, by measuring deployment progress over the past five years.[14] Based on the Commission's finding that deployment was reasonable and timely in past years' reports, and on the significant progress described in these comments in deployment, consumer adoption, and customer satisfaction—including the wireless industry's above-and-beyond response to COVID-19—the Commission should once again find that the progress of deployment continues to be reasonable and timely.

B. Since the *Fifteenth Report*, U.S. Providers Have Continued to Invest in, and Deploy, World-Leading Mobile Broadband Coverage and Capacity.

Since the Commission's last report, the wireless industry continued investing in deployment at a world-leading pace—in the process intensifying U.S. 5G rollout, driving America's 5G economy, and supporting a prodigious increase in mobile traffic (including more wireless connections than ever before). Since the start of 2010, U.S. wireless providers invested over a quarter of a *trillion* dollars in American networks.[15] In the 4G era, investments in network equipment, cell sites, software, and other network needs grew to a total of $261.0 billion—a 43 percent increase from the decade prior.[16] In 2019 alone, reported industry investment increased

language of [a] subsection" predicated first on tense used by Congress).

[14] *Sixteenth Report NOI* ¶ 9.

[15] *2020 Annual Survey Highlights* at 3.

[16] By way of comparison, wireless capital investment totaled $18.9 billion between 1983 (when cellphones first became available to the public) and 1995 (the start of the 2G era); $108 billion during the 2G era; and $183.1 billion in the 3G era between 2003 and 2010. *See also* RECON ANALYTICS, *The 4G Decade: Quantifying the Benefits*, at 5 (July 29, 2020) http://reconanalytics.com/wp-content/uploads/2020/07/The-4G-Decade-1.pdf (*Recon Analytics 4G Study*) (link triggers download).

to $29.1 billion, marking a four-year high.[17] This accounts for 18 percent of the world's spending on mobile capex for the year, despite the fact that the U.S. represents just 4.5 percent of the world's population.[18] And wireless use increased last year across all meaningful metrics, as the industry continues to build the networks that will power our economy over the next decade.

For instance, 4G LTE networks continue to expand throughout the United States as mobile broadband continues to be deployed in a reasonable and timely fashion to more Americans than at any previous point in our nation's history. In 2018, the Commission's most recent *Communications Marketplace Report* found that 4G LTE service was available to at least 99.9 percent of our country's population, with more than 98 percent able to choose from at least three 4G LTE service providers—covering more than 77 percent of the United States' total land area.[19] And providers have not rested on their laurels; these networks are now supported by a record 395,562 active cell sites across the country, many of which support multiple base stations.[20] 2019 alone saw a growth of more than 46,000 new sites—more than in the preceding three years combined.[21] Nearly 10 percent of the GDP increase of the entire U.S. economy from 2011–2019 was due to the growth of the U.S. wireless industry,[22] and U.S. 4G networks

[17] *2020 Annual Survey Highlights* at 3.

[18] *Id.* at 4.

[19] *Communications Marketplace Report et al.*, Report, 33 FCC Rcd 12558, 12593 Fig. A-29 (2018) (*2018 Communications Marketplace Report*).

[20] *2020 Annual Survey Highlights* at 6.

[21] *Id.*

[22] *Recon Analytics 4G Study* at 5.

supported 20 million jobs,[23] drove nearly $700 billion in economic contribution last year alone,[24] and saved consumers $130 billion *each year*.[25]

The ever-expanding availability of mobile broadband has helped, and continues to help, bridge of the digital divide. As the Commission noted in its most recently released data, as of 2018 approximately 91 percent of the rural population was covered by at least three LTE service providers, up seven percentage points from the previous year's 84.2 percent.[26] While the *2020 Communications Marketplace Report* has not yet been published, wireless providers have maintained aggressive rural deployment plans, and this positive trend is expected to continue. And expanded rural coverage yields a wide range of benefits that accompany increased access to the internet. As Chairman Ajit Pai has noted, by expanding broadband access in rural areas, we can "expand access to jobs, expand access to education, expand access to entertainment and culture, expand access to civic participation, and expand access to healthcare."[27]

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[23] *Id.* at 3.

[24] *Id.* at 15.

[25] *Id.* at 13.

[26] See *2018 Communications Marketplace Report*, 33 FCC Rcd at 12594 ¶ 45 (a figure which was itself a 3.6 percentage point jump from the prior year).

[27] Remarks of FCC Chairman Ajit Pai at the Hawaiian International Conference of Science Systems at 4 (Jan. 10, 2020), https://docs.fcc.gov/public/attachments/DOC-361862A1.pdf. *See also* Letter from Roger F. Wicker, Chairman, Senate Committee on Commerce, Science, and Transportation, at 1 (June 2, 2020) ("Access to high-speed broadband is critical for Americans in this digital age. Increasingly work, school, health care, and connecting with loved ones take place online in a digital format. This trend has only accelerated during the COVID-19 pandemic."); "Cantwell Stresses Need for Widespread, High-Speed Broadband, Especially During Coronavirus Crisis," Press Release, Sen. Maria Cantwell, at 1 (May 13, 2020) ("[F]unctioning broadband is absolutely necessary for every American home…. [N]ow, we are in the middle of a crisis where people who are disconnected from school, work, healthcare, friends, and family need access urgently.").

While 4G LTE network access continues to expand, the U.S. continues to develop a world-leading 5G economy as America's wireless providers aggressively deploy 5G networks in parallel. Nationwide wireless providers launched 5G service in 2019, representing a significant investment in resources and infrastructure. By the end of 2019, U.S. wireless providers had deployed active 5G networks covering more than 200 million people, and more than 5,000 cities and towns across America.[28] As of July 8, 2020, there were 6,087 cities with commercially available 5G deployments in the U.S.[29] Deployment has continued to progress since then. For instance, T-Mobile's number of covered towns and cities has grown to more than 7,500, and the covered population to more than 250 million, across more than 1.3 million square miles, much of it in rural America.[30] T-Mobile's 5G network relies on 600 MHz low- and 2.5 GHz band spectrum.[31] AT&T's 5G offering covers more than 200 million Americans, living in more than 400 named markets nationwide, including more than 370 using sub-6 GHz spectrum,[32] the

[28] *T-Mobile 5G: It's On! America's First Nationwide 5G Network Is Here*, T-MOBILE (Dec. 2, 2019), https://www.t-mobile.com/news/press/americas-first-nationwide-5g-network; Ed Oswald & Chris de Looper, *T-Mobile 5G Rollout: Here's Everything You Need to Know*, DIGITALTRENDS (May 6, 2020), https://www.digitaltrends.com/mobile/t-mobile-5g-rollout/.

[29] Ookla Speedtest Global Index, United States (Aug. 2020), https://www.speedtest.net/global-index/united-states#market-analysis.

[30] *Already Nationwide, T-Mobile Supercharges 5G Speeds for Millions More People in Over 80 New Cities & Towns*, T-MOBILE (Sept. 2, 2020), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/Already-Nationwide-T-Mobile-Supercharges-5G-Speeds-for-Millions-More-People-in-Over-80-New-Cities--Towns/default.aspx; T-MOBILE, *T-Mobile Launches World's First Nationwide Standalone 5G Network* (Aug. 4, 2020), https://www.t-mobile.com/news/network/standalone-5g-launch.

[31] *T-Mobile 5G: It's On! America's First Nationwide 5G Network Is Here*, T-MOBILE (Dec. 2, 2019), https://www.t-mobile.com/news/press/americas-first-nationwide-5g-network; Ed Oswald & Chris de Looper, *T-Mobile 5G Rollout: Here's Everything You Need to Know*, DIGITALTRENDS (May 6, 2020), https://www.digitaltrends.com/mobile/t-mobile-5g-rollout/.

[32] Scott Mir, *New Year, New Ways for AT&T Customers to Connect*, AT&T TECH. BLOG (Jan. 3, 2020), https://about.att.com/innovationblog/2020/01/2019_5g_recap.html; Eric Zeman & Hadlee Simons, *AT&T Adds 20 New 5G US Cities, Bringing Nationwide Total to 100 Markets*,

propagation characteristics of which will enable AT&T's 850 MHz signals to cover "roughly two-mile distances from towers, including [. . .] 'rural' usage,"[33] as well as mmWave spectrum in parts of 35 cities. And Verizon currently offers its 5G Ultra Wideband service, leveraging its millimeter wave spectrum, in parts of 36 cities,[34] as well as its 5G Home fixed wireless service in other cities.[35] Verizon is reportedly on track to have its mobile Ultra Wideband 5G service in more than 60 cities by the end of the year, and its 5G home fixed wireless in ten markets in the same timeframe.[36]

Rural and regional providers, as well as other industry stakeholders, are also planning and executing 5G deployment strategies. U.S. Cellular, for example, launched 5G on 600 MHz spectrum in hundreds of communities in Iowa and Wisconsin earlier this year,[37] all while

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ANDROID AUTHORITY (Mar. 17, 2020), https://www.androidauthority.com/att-5g-cities-1057351/.

[33] Jeremy Horwitz, *AT&T Promises Low-Band 5G for 5 Cities in Weeks, 15 by Early 2020*, VENTUREBEAT (Nov. 22, 2019, 6:59 AM) https://venturebeat.com/2019/11/22/att-promises-low-band-5g-for-5-cities-in-weeks-15-by-early-2020/.

[34] *Verizon 5G Ultra Wideband Service Available in More Cities*, VERIZON (Aug. 6, 2020), https://www.verizon.com/about/news/verizon-5g-ultra-wideband-service-available-more-cities.

[35] *Id.*

[36] Monica Alleven, *Verizon CEO: Expect a Lot of 5G Noise in Second Half of 2020*, FIERCE WIRELESS (Jul. 24, 2020), https://www.fiercewireless.com/operators/verizon-ceo-expect-a-lot-5g-noise-second-half-2020

[37] *See, e.g.*, Chad Thompson, *5G Is a Go: U.S. Cellular Turns on Network for Northern Iowa Customers*, THE MESSENGER (Mar. 8, 2020), https://www.messengernews.net/news/local-news/2020/03/5g-is-a-go/; Chantelle Grove, *Carroll Included in U.S. Cellular Central Iowa 5G Upgrade*, CBC ONLINE (Mar. 10, 2020), https://www.1380kcim.com/news/2020/carroll-included-in-u-s-cellular-central-iowa-5g-upgrade/; Leah Jones, *U.S. Cellular Turns on 5G Network for Eastern Iowa Customers*, RADIO KEOKUK (Mar. 6, 2020), https://www.radiokeokuk.com/2020/03/u-s-cellular-turns-on-5g-network-for-eastern-iowa-customers/; Emily Thornton, *Racine Becomes First Wisconsin City to Have 5G with Launch of US Cellular's Network*, CBS 58 (Feb. 26, 2020, 1:20 PM), https://www.cbs58.com/news/racine-becomes-first-wisconsin-city-to-have-5g-with-launch-of-us-cellulars-network; Erica Dynes, *Reedsburg Among First Cities in State to Access U.S. Cellular 5G Network*, REEDSBURG TIMES-

planning to launch in parts of 11 more states during the balance of 2020.[38] At the end of August, U.S. Cellular continued its network expansion by launching 5G in 19 communities in Maine, initially using 600 MHz spectrum.[39] U.S. Cellular also announced it has begun building out millimeter wave spectrum in the 24 GHz, 28 GHz, and 39 GHz bands, and expects to launch 5G in those bands in 2021. Bluegrass Cellular also announced a partnership with ClearSky Technologies to design 5G networks for two cities in its service area,[40] Cellcom has invested nearly $1 million in 2019 acquiring 24 GHz and 28 GHz spectrum for 5G covering several counties in Wisconsin,[41] and GCI launched 5G in Anchorage, Alaska[42]—and plans to expand service throughout the city and beyond. And last year, Carolina West announced that it will buy

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PRESS (Mar. 9, 2020), https://www.wiscnews.com/reedsburgtimespress/news/local/reedsburg-among-first-cities-in-state-to-access-u-s-cellular-5g-network/article_8f69f88e-801d-509f-b37d-6f775f8d5338.html.

[38] Carl Weinschenk, *U.S. Cellular 5G in 11 More States This Year*, TELECOMPETITOR (July 30, 2020, 1:14 PM), https://www.telecompetitor.com/u-s-cellular-5g-in-11-more-states-this-year/#:~:text=U.S.%20Cellular%205G%20service%20will,Virginia%2C%20Washington%20and%20West%20Virginia.

[39] *U.S. Cellular turns on 5G network for some Maine customers*, BANGOR DAILY NEWS (Sept. 1, 2020), https://bangordailynews.com/2020/09/01/bdn-maine/u-s-cellular-turns-on-5g-network-for-some-maine-customers/; *U.S. Cellular turns on 5G network for Belfast customers*, WALDO COUNTY FREE PRESS (Aug. 31, 2020), https://waldo.villagesoup.com/p/u-s-cellular-turns-on-5g-network-for-belfast-customers/1869190.

[40] *Bluegrass Cellular Employs ClearSky's NetView 360 Service to Evaluate Design Options for 5G Wireless Deployment*, PRWEB (July 9, 2020), https://www.prweb.com/releases/bluegrass_cellular_employs_clearskys_netview_360_service_to_evaluate_design_options_for_5g_wireless_deployment/prweb16403550.htm.

[41] *Cellcom Spends Nearly $1 Million on Wisconsin 5G Spectrum*, TELECOMPETITOR (June 19, 2019, 11:59 AM), https://www.telecompetitor.com/cellcom-spends-nearly-1-million-on-wisconsin-5g-spectrum/.

[42] *GCI Cuts the Ribbon on Alaska's First 5G Service*, GCI (Apr. 20, 2020), https://www.gci.com/about/newsreleases/gci-launches-alaskas-1st-5g#:~:text=ANCHORAGE%2C%20Alaska%20%E2%80%94%20It's%20official%3A,in%20the%20spring%20of%202020.

LTE and 5G equipment, as well as Voice over LTE (VoLTE) and Wi-Fi calling services from Ericsson to help the company densify, expand, and evolve its networks for 5G wireless service.[43] All this, while other providers also work towards launches of 5G-capable networks in the near term.[44]

With these substantial investments and progress in deployment, U.S. 5G networks will power significant growth in innovation and jobs across industries. The evolving 5G economy will continue to deliver benefits in transportation, manufacturing, agriculture, education, retail, healthcare, energy, and more.[45] As Commissioner Jessica Rosenworcel has noted, "this technology will become an input in everything we do, bringing new effectiveness and efficiency to every sector of our economy."[46] For example, 5G will support an expanding number of educational use cases, including faster speeds and a more robust video experience, promoting

[43] Press Release: *Carolina West Wireless Signs Multi-Year Network Modernization Deal with Ericsson*, ERICSSON (May 9, 2019), https://www.ericsson.com/en/press-releases/6/2019/carolina-west-wireless-signs-multi-year-network-modernization-deal-ericsson; *Carolina West Wireless Preps for 5G*, INSIDE TOWERS (May 23, 2019, 5:57 AM), https://insidetowers.com/cell-tower-news-carolina-west-wireless-preps-for-5g/.

[44] *See, e.g.*, *Inland Cellular Selects Parallel Wireless for Cost-Effective 4G Expansion*, MARKETS INSIDER (May 20, 2019, 4:00 PM), https://markets.businessinsider.com/news/stocks/inland-cellular-selects-parallel-wireless-for-cost-effective-4g-expansion-1028214928; *5G in Rural Areas: Connecting the Clever Countrysides*, VOICE&DATA (June 4, 2020), https://www.voicendata.com/5g-rural-areas-connecting-clever-countrysides/.

[45] *See, e.g.*, BCG, *Building the U.S. 5G Economy* (Sept. 14, 2020); *see also* CTIA, *Building the U.S. 5G Economy* (Sept. 14, 2020), http://ctia.org/news/report-building-the-united-states-5g-economy ("5G networks will improve existing application and enable innovations that increase productivity and cost competitiveness, and improve health and safety. 5G technologies are expected to create millions of jobs and contribute trillions to global GDP.").

[46] Remarks of FCC Commissioner Jessica Rosenworcel at the FCC Forum on 5G Open Radio Access Networks at 1 (Sept. 20, 2020), https://docs.fcc.gov/public/attachments/DOC-366876A1.pdf.

learning opportunities and increasing educational attainment, especially as more students attend school remotely than ever before. 5G will also transform the way healthcare is provided in the United States, enabling solutions that address the difficulty of providing specialized care over long distances, particularly when patients are more inclined to seek healthcare from home. Indeed, 5G's large bandwidth and low latency will enable a data-rich user experience and can support new telemedicine services and tools, such as remote video conferencing and remote monitoring, data collection, and diagnosis.[47]

As Commissioner Geoffrey Starks noted, "[o]ur country has long been a technology leader in software and wireless technology . . ."[48] As we transition to the next generation of wireless, wireless investment and innovation will enable the U.S. to continue to ensure that American consumers and businesses benefit from our new 5G economy and the exponential benefits that promise to ensue.[49]

C. Wireless Services Are Central to American Consumers' Lives.

As wireless broadband has become more widely available, consumers have incorporated wireless services, devices, and solutions into their daily lives. Consumers increasingly use their wireless devices to facilitate daily activities and easier access to information, including employment opportunities, news, healthcare, transportation, public safety, entrepreneurship, and education.

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[47] Dan Sullivan, *5G Network Infrastructure Fuels Telehealth Advances, Healthcare Cost Reduction*, CISCO (June 14, 2019), https://www.cisco.com/c/en/us/solutions/enterprise-networks/5g-network-infrastructure-telehealth.html.

[48] Remarks of FCC Commissioner Geoffrey Starks at the Forum on 5G Open Radio Access Networks at 1 (Sept. 14, 2020), https://docs.fcc.gov/public/attachments/DOC-366868A1.pdf.

[49] *See infra* Section IV.

Americans are increasingly dependent on wireless services and devices, with notable increases in mobile-connected laptops, tablets, and data-only devices, while innovative IoT-connected devices grow in availability and adoption.[50] And mobile services have transformed consumers' lives, allowing them to access many of their daily needs with a tap of the screen.[51] The onset of the pandemic only further accelerated Americans' transition to a mobile-first economy. In the first half of 2020, the average American mobile device user spent 10 percent more time on their devices, with much of that time being spent on educational, business, communications, and shopping apps.[52] According to Android user data, in the first half of the year mobile gaming was up 13 percent, shopping app use was up 10 percent, and financial app use was up 65 percent at its height as Americans coped with coronavirus lockdowns.[53] U.S. companies like Walmart and DoorDash focused on mobile apps, with app downloads more than doubling for Walmart and growing by over a quarter for DoorDash between May 2019 and June 2020.[54] And mobile apps proved essential in supporting children's education with Android user

[50] *2020 Annual Survey Highlights* at 8.

[51] For example, Apple's App Store—which offers consumers applications for services ranging from banking and news, to streaming television, gaming, music, fitness, and much more—is visited by more than half a billion people each week. *See Apple Rings In New Era of Services Following Landmark Year*, APPLE (Jan. 8, 2020), https://www.apple.com/newsroom/2020/01/apple-rings-in-new-era-of-services-following-landmark-year/.

[52] *How COVID-19 Has Changed Consumer Behavior on Mobile Forever*, APP ANNIE (Aug. 17, 2020) (*App Annie Report*), https://www.appannie.com/download/en/insights/market-data/covid19-consumer-behavior-mobile/2008-H1-2020-COVID19-Mobile-Impact-EN.pdf.

[53] *Id.* at 8–9, 11.

[54] *Top Food Delivery Apps in the U.S. for May 2020 by Downloads*, SENSOR TOWER (Jun. 5, 2020), https://sensortower.com/blog/top-food-delivery-apps-united-states-may-2020,

data alone indicating a 70 percent increase in the time spent in educational apps between the fourth quarter 2019 and the second quarter 2020.[55]

Investment in network capacity means the wireless industry is ready to meet growing demand for mobile data. Last year, subscribers used more than 37.06 trillion MBs of data—30 percent growth year-over-year.[56] The additional 8.5 trillion MBs added in the last year was 43 percent more than the industry's first four years of data traffic combined.[57] And this trend is far from abating; consumers' mobile-first lifestyle will create a growing number of opportunities for digital transformation—for businesses to ensure greater agility and flexibility, and experiment with how to best deliver value to customers, particularly as we transition to advanced 5G technologies.

Consistent with these statistics, per the Pew Research Center's latest data, a staggering 96 percent of Americans now own a mobile device of some kind, and smartphone adoption is up across demographics, rising from 35 percent in 2011 to 81 percent overall in 2019.[58] This includes the one out of every five Americans who are "smartphone-only" internet users who own a smartphone but do not have non-mobile wireless internet at home.[59]

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[55] *See App Annie Report.*

[56] *2020 Annual Survey Highlights* at 7.

[57] *Id.*

[58] Monica Anderson, *Mobile Technology and Home Broadband 2019*, PEW RESEARCH CTR. (June 13, 2019) (*Pew Mobile Broadband Report 2019*), https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/; Mobile Factsheet, PEW RESEARCH CTR. (June 12, 2019) (*Pew Mobile Factsheet 2019*), https://www.pewresearch.org/internet/fact-sheet/mobile/.

[59] *Id.*

Wireless also greatly benefits the lives of persons with disabilities, older adults, and veterans.[60] For instance, seniors have greatly expanded their use of wireless, with 91 percent owning a cellphone, and the majority (53 percent) owning a smartphone.[61] And 5G and IoT will further transform the possibilities for independent living and improved senior care, as wearable health devices and 5G-enabled telehealth capabilities make remote healthcare more accessible and reliable for seniors, as smart voice-enabled devices improve seniors' autonomy at home, and as autonomous vehicles eventually improve senior mobility options.[62]

Indeed, every year the wireless industry makes innovative advances that consumers could have barely envisioned just a few years ago, but have quickly become a central part of consumers' daily lives, like the ability to activate device commands using voice, use a built-in screen reader, or customize a device display to provide a more user-friendly cognitive experience. As a result, wireless devices have become even more useful and important to people

[60] CTIA's AccessWireless.org continues to make the latest wireless accessibility information and resources available for consumers, includes a new A-Z database of "Wireless Accessibility Services," and supports use of the Global Accessibility Reporting Initiative (GARI) tool (a searchable database with information on the accessibility settings and features available on devices such as mobile phones, tablets and wearables) to help consumers quickly find information from the many wireless service providers and manufacturers that offer accessibility resources. *See* Access Wireless: Wireless for All, ACCESSWIRELESS, https://www.accesswireless.org/ (last visited Sept. 6, 2020). CTIA continues to provide wireless accessibility information and resources specific to seniors, disabled veterans, and individuals with specific needs related to hearing, vision, mobility, speech, and cognition. The wireless industry recognizes the service and sacrifice of active duty and retired members of the U.S. Armed Forces, and offers various wireless plans and programs to keep veterans and military families connected. *Veterans: A Guide to Wireless Services and Resources*, ACCESSWIRELESS, https://www.accesswireless.org/resources-for-consumers/veterans-resources (last visited Sept. 6, 2020).

[61] CTIA, *Wireless Empowers America's Seniors* (Aug. 21, 2020), https://www.ctia.org/news/wireless-empowers-americas-seniors.

[62] *Id.*

with disabilities. As the Rehabilitation Engineering Research Center for Wireless Inclusive Technologies (Wireless RERC) found, 96.9 percent of people with disabilities who were surveyed reported owning or using a wireless device, such as a feature phone, smartphone, tablet, or wearable device, and 87.7 percent reported owning a smartphone.[63]

As consumers also rely on wireless for connectivity during emergencies, wireless providers work hard to maintain critical communications services for consumers in disaster-affected areas in the face of the wildfires, hurricanes, and other crises. Wireless providers have continued to invest in resilient networks with redundancy features such as backup power at critical coverage cell sites, deploying temporary wireless facilities to improve service in areas where permanent wireless towers may have been damaged, and dispatching emergency response teams to address a wide variety of network and community challenges in the field.[64]

[63] *Survey of User Needs, SUNspot 1: Use of Mobile Phones by Individuals with Disabilities, 2017-2018, Volume 2019, Number 19-01*, WIRELESS INCLUSIVE RERC (Apr. 2019), http://www.wirelessrerc.gatech.edu/sites/default/files/publications/sunspot_2019-01_final_use_of_mobile_phones_by_individuals_with_disabilities_2017-2018.docx.

[64] *See, e.g.*, CTIA, *Preparing for Emergencies*, https://prepared.ctia.org/ (last visited Sept. 6, 2020) (detailing everything from industry's pre-disaster investment in hardened networks, to its commitment to post-disaster recovery); *see also, e.g.*, Comments of CTIA, GN Docket No. 20-60, at 44–57 (filed Apr. 27, 2020) (detailing, in Roman IV, the many ways in which the wireless industry continues to innovate and invest in protecting consumers and public safety); *see also* Letter from Matthew Gerst, Vice President, CTIA, to Marlene H. Dortch, Secretary, FCC, PS Docket No. 11-60 (filed June 22, 2020) (detailing CTIA's member's significant and ongoing commitment to wireless network resiliency, since "[w]hether it be in the face of natural disasters, in the midst of a national pandemic, or during sunny days, consumers depend on wireless connectivity services more than ever to reach loved ones, call for help, and obtain the latest emergency information.").

D. The COVID-19 Pandemic Demonstrates that Consumers Can Rely Upon Mobile Broadband Services.

The *Sixteenth Report NOI* also solicits comment on the impact of the COVID-19 pandemic, including its effect on broadband deployment and adoption rates.[65] Wireless providers' investment and deployment efforts laid the foundation for the industry's response to COVID-19, a crisis that has reinforced the critical importance of wireless connectivity and has further challenged the industry to maintain advanced networks that meet the ever-increasing data needs of American consumers. While hard work from industry and policymakers remains necessary to ensure that mobile broadband services are available to all consumers, rapid action by policymakers, including the Commission, also enabled wireless providers to quickly add capacity and maintain or create new connections for consumers relying on mobile wireless services throughout COVID-19.

1. Wireless Networks Have Kept Americans Connected Throughout the Pandemic.

As the ways we live and work changed seemingly overnight in response to social distancing policies related to COVID-19, America's wireless networks were able to handle these dramatic increases in contrast to providers in many other countries. In the United States, mobile data speeds went *up* slightly in April 2020[66]—with researchers finding that America's wireless networks actually had a "statistically-significant increase in download speeds."[67] Comparatively,

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[65] *Sixteenth Report NOI* ¶ 29.

[66] *COVID-19 Wireless Connectivity Study*, CTIA (June 23, 2020), https://www.ctia.org/news/blog-how-wireless-kept-americans-connected-during-covid-19 (an explanatory blog from CTIA's President and CEO on the previously cited study).

[67] George S. Ford, PhD, *COVID-19 and Broadband Speeds: A Multi-Country Analysis*, PHOENIX CENTER, at 2 (May 2020), https://www.phoenix-center.org/PolicyBulletin/PCPB49Final.pdf.

mobile speeds dropped in China and in Europe alike (40 percent in the former, ~15 percent in countries such as Spain in the latter). Commissioner Michael O'Rielly recognized these U.S. efforts, stating "American wireless providers and those serving the industry should hold their heads high knowing their efforts helped keep a nation connected throughout one of its most difficult moments."[68] Thus, while America's mobile speeds kept pace, consumers expressed widespread approval of their wireless experience as well as industry's COVID-19 response. This is because U.S. wireless networks did what they were designed to do: handle dramatic shifts and increases in use with relative ease. For example, the pandemic has seen voice traffic increase from 20 to 40 percent on wireless networks[69]—a spike in growth made all the more significant since nearly 80 percent of voice connections in the United States are wireless.[70] COVID-19 also drove significant increases in wireless broadband demand, with mobile data traffic up nearly 20 percent.[71] For some wireless providers, that is the equivalent of adding almost eight months of data increases practically overnight—yet U.S. wireless networks handled this abrupt spike in traffic via the rapid reconfiguration of capacity.[72] And this COVID-19-traffic increase is on top of the regular rising mobile data traffic trends, which, as noted above, are significant in their own

[68] Remarks of FCC Commissioner Michael O'Rielly Before the New Jersey & New York Wireless Associations' 2020 Update Webinar at 1 (July 9, 2020), https://docs.fcc.gov/public/attachments/DOC-365441A1.pdf.

[69] *COVID-19 Wireless Connectivity Study* at 2.

[70] *Id.*

[71] *Id.* at 2–3.

[72] *Id.* at 3.

right.[73] For instance, the mobile data traffic in 2019 was almost four times the entirety of mobile data traffic just four years ago.[74]

Wireless providers have also responded to the connectivity challenges raised by COVID-19 for remote learning, telehealth, and many other sectors of our economy. As a result, mobile hotspot use has soared, and application use has skyrocketed. One nationwide provider found customers were using their mobile device's hotspot nearly 40 percent more than average to share that mobile data connection with other devices.[75] For instance, the Cleveland Clinic saw a monthly increase in telehealth visits of more than 1,700 percent.[76] Video conferencing and online collaboration platforms saw usage increase more than twenty-fold, and educational app traffic jumped nearly 150 percent.[77] And the strong performance by U.S. wireless networks is particularly important for the nearly 20 percent of Americans who own a smartphone but do not have fixed broadband connections at home.

Ultimately, the mobile wireless industry's ability to maintain a consistent level of service in these trying times is the cumulative product of all the above-described investment and deployment, bolstered by pro-deployment approaches from policymakers including the Commission. In addition to the Commission's longstanding national regulatory framework that promotes competition and investment, we have seen unprecedented efforts to quickly put available spectrum in use to prepare for millions of Americans working and learning from home

[73] *Id.*

[74] *Id.*

[75] *Id.*

[76] *Id.* at 3 (reporting increase in telehealth visits across all broadband platforms).

[77] *Id.*

and to develop emergency filing and siting provisions, and we applaud the Commission for moving forward so quickly to help connect more consumers.[78]

2. Wireless Delivers Solutions to Maintain Connections to Healthcare, School, and Work During the Pandemic.

The wireless industry has responded to the challenge of adjusting to the sudden and significant changes in living, learning, and working caused by the pandemic. Wireless providers pledged to keep Americans connected, and provided support to millions of subscribers impacted by COVID-19. Wireless providers are also expanding options and increasing mobile data for low-income consumers, including through their Lifeline partners and programs, during this period. These connections help ensure that consumers maintain reliable voice and data connections that power the remote health, learning, and work applications they depend on.

To be sure, these are not the only efforts wireless providers are making; the wireless industry is also expanding existing industry-leading efforts to ensure students can keep learning with wireless tools and resources. This includes the Connecting Kids Initiative, a resource for schools and school districts to help keep kids learning in these unprecedented times.[79] Other examples include:

- AT&T donated 11,000 wireless hotspots to the Santa Clara County Office of Education and San Jose Public Library System for students and households in San Jose, California who lack internet access as they prepare to start the school year virtually due to COVID-19.[80] And AT&T employees continue to volunteer their time with the AT&T Believes, completing ship-to-home projects that show appreciation

[78] CTIA, *The Wireless Industry Responds to COVID-19—Putting Spectrum to Work*, https://www.ctia.org/covid-19#putting-spectrum-to-work (last visited Sept. 6, 2020).

[79] CTIA, *Connecting Kids Initiative*, https://www.ctia.org/the-wireless-industry/connecting-kids-initiative (last visited Sept. 6, 2020).

[80] KPIX CBS SF BAY AREA, *AT&T Partners With San Jose to Provide Free Wi-Fi to Needy Students*, YOUTUBE (Aug. 3, 2020), https://youtu.be/On6g-sG_RUk.

for healthcare workers and support community food banks.[81] AT&T also partnered with IBM to deploy 5G and wireless technologies to help businesses adapt to virtual work environments during COVID-19,[82] and created guidelines that companies can use to maintain accessible workplaces while navigating a post-COVID-19 world.[83]

- Verizon has collaborated with several leading state education agencies in California, Texas, Massachusetts, Georgia, and South Carolina to equip more than 36 million K-12 students in 38 neighboring states with access to distance learning technologies, including 4G LTE Internet access, mobile device management and security solutions.[84] The Verizon Innovative Learning program has partnered with Title I schools across the country to provide connectivity, technology, and teacher resources to foster digital inclusion, and STEM education.[85] Separately, Verizon collaborated with productivity app Todoist to offer free access to the app's premium services to help teachers and students prepare for the upcoming school year.[86]

- T-Mobile recently announced an educational initiative, Project 10 Million, committing $10.7 billion dollars toward delivering internet connectivity to millions of underserved student households at no cost to them.[87]

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[81] *A&T Believes at Home*, AT&T (Aug. 12, 2020), https://about.att.com/newsroom/2020/att_believes_at_home.html.

[82] Mo Katibeh and Steve Canepa, *AT&T and IBM: Helping Businesses Adapt to New Work Environments*, AT&T (Aug. 18, 2020), https://about.att.com/innovationblog/2020/08/att_ibm.html.

[83] *Accessibility Raises Unique Considerations in the COVID-19 World of Work*, AT&T (Aug. 18, 2020), https://about.att.com/sites/accessibility/stories/covid19-return-to-workplace.html.

[84] *Texas Education Agency and Verizon Enable Distance Learning for 18.9M Students in 16 States*, VERIZON (Aug. 20, 2020), https://www.verizon.com/about/news/texas-education-agency-verizon; *Massachusetts and Verizon Enable Distance Learning for 4.7M More Students*, VERIZON (Aug. 20, 2020), https://www.verizon.com/about/news/massachusetts-verizon-distance-learning.

[85] *Technology, Education, Opportunity*, VERIZON, https://www.verizon.com/about/responsibility/digital-inclusion/verizon-innovative-learning (last visited Sept. 11, 2020).

[86] *Verizon Partners with Todoist to Support Students and Teachers as they Get Ready for the School Year*, VERIZON (Aug. 5, 2020), https://www.verizon.com/about/news/verizon-partners-todoist.

[87] *T-Mobile Launches Project 10Million, Historic $10.7B Initiative Aimed at Closing the Homework Gap and Connecting Students to Opportunity – for Free*, T-MOBILE (Sept. 3, 2020), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/T-Mobile-Launches-Project-10Million-Historic-10.7B-Initiative-Aimed-at-Closing-the-Homework-Gap-and-Connecting-Students-to-Opportunity--for-Free/default.aspx

The ongoing pandemic has also shown us that more can be done by policymakers to ensure the continued resiliency and reliability of our wireless networks, ensure American leadership in the emerging global 5G economy, and spur economic growth and job creation post-pandemic, as discussed in Section IV below.

E. Reasonable and Timely Mobile Wireless Deployment Also Continues to Drive Additional Beneficial Use Cases.

As the reasonable and timely deployment of mobile wireless broadband networks continues apace, consumers increasingly benefit from innovative use cases, such as telehealth and IoT—helpful not only in the current pandemic-driven context, but beyond it as well.[88] And CTIA commends the Commission for the range of mobile telehealth-related pandemic relief grants it has made. In addition to numerous grants for mobile hotspots, these have included funding to:

- Greene County General Hospital (Linton, IN), totaling $60,480 "to expand its *mobile telehealth capacity to ensure continued care to its patients, including its senior patient population, that have been displaced by the emergency COVID-19 response* within its current facilities;"[89]
- Avenue 360 Health and Wellness (Houston, TX), totaling $297,975 "to provide video telemedicine services to low-income and vulnerable patients at risk for COVID-19 through *mobile telehealth sites at public housing locations*;"[90]

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[88] *See, e.g., Global Internet of Things (IoT) Market Insights Report 2020*, BUSINESSWIRE (May 27, 2020, 9:06 AM), https://www.businesswire.com/news/home/20200527005557/en/Global-Internet-Things-IoT-Market-Insights-Report ("Amid the COVID-19 crisis and the looming economic recession, the Internet of Things (IoT) market worldwide will grow by a projected US$876.5 Billion, during the analysis period, driven by a revised compounded annual growth rate (CAGR) of 31.4%."); *see also 2020 Annual Survey Highlights* at 8.

[89] Press Release, FCC, *FCC Approves Fourth Set of COVID-19 Telehealth Program Applications* (Apr. 29, 2020), https://docs.fcc.gov/public/attachments/DOC-364066A1.pdf (emphasis added).

[90] Press Release, FCC, *FCC Approves Fifth Set of COVID-19 Telehealth Program Applications* (May 6, 2020), https://docs.fcc.gov/public/attachments/DOC-364192A1.pdf (emphasis added).

- Goodwill NYNJ Clinic (New York, NY), totaling $435,879 "for connected devices, *cellular data plans, and hotspots* to allow patients and providers to interact via voice and video platforms;"[91]

- Harbor (Toledo, OH), totaling $328,126 "for laptop computers, tablets, a patient wellness application license, *mobile data plans*, video telehealth licenses, and other telehealth equipment;"[92]

- Heartland Regional Medical Center (Saint Joseph, MO), totaling $266,800 "for tablets and *wireless data plans* as well as connected remote monitoring equipment and telehealth software licenses;"[93]

- Mental Health Association of Essex and Morris (Montclair, NJ), totaling $39,959 "for phones, *wireless data service plans*, and telehealth software;" [94]

- Leyden Family Health Service and Mental Health Center (Franklin Park, IL), totaling $1,468 "for *phones, wireless data plans* and videoconferencing software;"[95]

- UPMC Passavant (Pittsburgh, PA), totaling $12,591 "for smartphones, data plans, and remote monitoring application;"[96]

- Medical Advocacy and Outreach (Montgomery, AL), totaling $288,847 for "deploying rapid response teams with mobile telehealth equipment to deliver care to COVID-19 symptomatic patients in their houses;"[97]

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[91] Press Release, FCC, *FCC Approves Seventh Set of COVID-19 Telehealth Program Applications* (May 20, 2020), https://docs.fcc.gov/public/attachments/DOC-364481A1.pdf (emphasis added).

[92] Press Release, FCC, *FCC Approves Eighth Set of COVID-19 Telehealth Program Applications* (May 28, 2020), https://docs.fcc.gov/public/attachments/DOC-364608A1.pdf (emphasis added).

[93] *Id.* (emphasis added).

[94] Press Release, FCC, *FCC Approves Ninth Set of COVID-19 Telehealth Program Applications* (June 3, 2020), https://docs.fcc.gov/public/attachments/DOC-364713A1.pdf (emphasis added).

[95] Press Release, FCC, *FCC Surpasses $100 Million in Approved COVID-19 Telehealth Program Applications* (June 10, 2020), https://docs.fcc.gov/public/attachments/DOC-364847A1.pdf (emphasis added).

[96] Press Release, FCC, *FCC Approves Eleventh Set of COVID-19 Telehealth Program Applications* (June 17, 2020), https://docs.fcc.gov/public/attachments/DOC-364980A1.pdf (emphasis added).

[97] Press Release, FCC, *FCC Approves Thirteenth Set of COVID-19 Telehealth Program Applications* (July 1, 2020), https://docs.fcc.gov/public/attachments/DOC-365302A1.pdf.

- Guam Community Health Center (Dededo, GU), totaling $321,244 "for tablets, *smartphones, mobile voice minutes,* and a patient telehealth application;"[98] and
- Texas A&M Health Family Clinic (Bryan, TX), totaling $110,295 for "mobile telehealth kits."[99]

These grants demonstrate that mobile broadband plays a vital role in telehealth applications, now more than ever.

To support further IoT deployment and innovation, nationwide providers have launched narrowband IoT networks,[100] which are already providing wide-reaching societal benefits in pandemic response and beyond. For example, AT&T has teamed up with Brain Corp to support data-rich IoT applications for autonomous mobile robots that have aided in COVID-19 sanitation efforts,[101] and T-Mobile has leveraged its network to help reduce coronavirus transmission, partnering with IoT manufacturers to deploy IoT devices capable of identifying individuals with flu-like symptoms and helping to enforce social distancing in public places.[102] Beyond COVID-19 applications, AT&T's IoT solutions are helping to reduce greenhouse gas emissions.[103]

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[98] Press Release, FCC, *FCC Approves Final Set of COVID-19 Telehealth Program Applications* (July 8, 2020), https://docs.fcc.gov/public/attachments/DOC-365417A1.pdf (emphasis added).

[99] *Id*.

[100] SDX Central, *Verizon Launches NB-IoT Network for Fixed Use Cases*, (May 14, 2019), https://www.sdxcentral.com/articles/news/verizon-launches-nb-iot-network-for-fixed-use-cases/2019/05/. *T-Mobile Launches America's First Nationwide Narrowband IoT Network*, T-MOBILE (July 19, 2020), https://www.t-mobile.com/news/press/americas-first-narrowband-iot-network.

[101] *AT&T and Brain Corp to Enable Autonomous Robots*, AT&T (April 7, 2020), https://about.att.com/story/2020/covid_19_brain_corp.html.

[102] *Stay Safe, America. T-Mobile Powering New Tech to Keep Workplaces Safe*, T-MOBILE (July 28, 2020), https://www.t-mobile.com/news/network/powering-new-tech-to-keep-workplaces-safe

[103] *AT&T Announces Renewable Energy Purchases will Surpass 1.5 Gigawatts of Clean Energy at Climate Week NYC 2019*, AT&T (Sept. 20, 2019), https://about.att.com/story/2019/climate_week_2019.html.

Partnerships like Verizon and Honeywell's seek to enable next-generation smart meters to help utilities "speed up and simplify the deployment of new communication-enabled, intelligent sensors and controls" for smart electric grids.[104] At the regional level, providers like U.S. Cellular are completing LTE-M networks to support mass adoption of IoT applications and deployment "in both urban and rural areas and hard-to-reach environments,"[105] supporting "solutions such as fleet and asset management, tank monitoring, smart meters and other applications."[106] Continued mobile broadband deployments will continue to drive these and other diverse IoT applications that benefit the public.

III. THE COMMISSION SHOULD CONSIDER A RANGE OF AVAILABLE DATA TO DETERMINE THAT MOBILE WIRELESS BROADBAND DEPLOYMENT CONTINUES TO BE REASONABLE AND TIMELY.

A. The Commission Should Consider Various Data Points to Determine that Mobile Broadband Is Being Reasonably and Timely Deployed.

As the Commission rightly noted in the *2020 Broadband Deployment Report* (and previously), a "single benchmark is unreliable in the mobile wireless context due to the inherent variability in the performance characteristics of mobile service both geographically and temporally[.]"[107] Given that many factors affect the consumer's wireless experience, the Commission should take a holistic view of deployment progress, factoring in such data points as

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[104] *Verizon and Honeywell Enable Utilities to More Quickly Deploy LTE Smart Meters*, VERIZON (Jan. 29, 2020), https://www.verizon.com/about/news/verizon-and-honeywell.

[105] *U.S. Cellular Launches LTE-M Network Optimized for IoT*, U.S. CELLULAR (Feb. 7, 2020), https://www.uscellular.com/get-to-know-us/our-company/press-room/2020/u-s-cellular-launches-lte-m-network-optimized-for-iot.

[106] *Id.*

[107] *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2020 Broadband Deployment Report, GN Docket No. 19-285, FCC 20-50 ¶ 16 (rel. Apr. 24, 2020).

investment and cell site growth—and not define "progress" by speed only. While the Form 477 data collection has been and continues to be a valuable resource, CTIA appreciates the Commission's and Congress's efforts to evolve its collection of mobile wireless deployment data in the Digital Opportunity Data Collection (DODC) and other proceedings to more closely reflect consumers' experiences. Consistent with the Broadband DATA Act,[108] the Commission required providers to submit service-level propagation maps with certain standardization reflecting 3G, 4G LTE, and 5G NR coverage, to help identify unserved rural areas to target policies to close the digital divide. As the Commission recognizes, "more granular, precise maps" will allow the Commission to target universal service support and advance a variety of other policy goals.[109]

Given that mapping mobile broadband service is complex, probabilistic, and multi-factored, the Commission is right that it should use various data points to assess the extent of broadband availability and to better reflect increasing consumer demand for, use of, and satisfaction with mobile wireless services. A holistic approach should be used to determine whether mobile wireless broadband is being deployed in a reasonable and timely manner—an inquiry which consumer demand and expectations reveal can only be answered in the affirmative.

[108] Broadband Deployment Accuracy and Technology Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) (codified at 47 U.S.C. §§ 641-646).

[109] *Establishing the Digital Opportunity Data Collection et al.*, Second Report and Order and Third Further Notice of Proposed Rulemaking, WC Docket Nos. 19-195 & 11-10, FCC 20-94 ¶ 1 (rel. July 17, 2020).

B. The Data Show that Mobile Wireless Broadband Deployment Is Meeting and Exceeding Consumers' Demands.

Mobile broadband providers are investing in expanding and deepening the capabilities of their networks, including upgrading existing facilities and deploying additional facilities in rural, urban, and suburban areas across the country, and launching evolutionary upgrades. And as noted above, wireless providers are adding capacity to support significant increases in wireless broadband demand due to COVID-19—with one provider seeing up to an 86 percent jump in subscribers connecting to cell sites only in their primary location, such as home.[110] The wireless industry responded to the challenge and mobile data speeds kept pace, thanks to wireless networks that were designed to handle dramatic shifts and increases in use. In fact, the wireless industry was seen as a leader for its handling of the pandemic, earning an 88 percent approval rating from the public, ranking better than internet companies, local schools, banks, and state and federal governments.[111] And wireless providers led the rankings in how well the 100 largest employers responded to the pandemic, with Verizon, AT&T, and T-Mobile all ranking in the top five spots.[112] Thanks to the industry's responsiveness, nearly three-quarters of Americans felt prepared to work from home.[113] Eight in ten of those working from home expected their

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[110] *See supra* Section III; *see also COVID-19 Wireless Connectivity Study* at 3.

[111] HarrisX (@Harris_X_), TWITTER (May 11, 2020, 11:04 AM), https://twitter.com/Harris_X_/status/1259862040535072768 (illustrating the COVID-19 Daily TMT Consumer Pulse Survey).

[112] *The Forbes Corporate Responders: New Ranking of Nation's Top Responses to Pandemic*, FORBES (Aug. 21, 2020), https://www.forbes.com/sites/ezequielminaya/2020/05/26/the-forbes-corporate-responders-new-ranking-of-nations-top-employers-responses-to-pandemic/#58945bdc4a51.

[113] HarrisX (@Harris_X_), TWITTER (Apr. 17, 2020, 4:48 PM), https://twitter.com/Harris_X_/status/1251251170372399109 (illustrating a pie chart on Connectivity in the Home).

wireless service provider to meet their data needs, besting both home internet providers and cable TV providers.[114] This broad approval was unwavering and remained steady throughout the height of the pandemic in early March through the end of April into early May.[115]

Consumers are increasingly embracing mobile broadband as their only source of connectivity, while the percentage of wireless-only households continues to grow each year, and mobile data use continues to increase.[116] The National Center for Health Statistics reported that as of December 2018, 91.5 percent of households had wireless phones, approximately 60 percent of them were wireless-only.[117] As of June 2019, 59.2 percent of adults lived in wireless-only households, while another 37.2 percent lived in households with both wired and wireless phones.[118] NTIA reports that as of November 2019, 87.1 percent of American households used

[114] HarrisX HarrisX (@Harris_X_), TWITTER (Apr. 17, 2020, 2:05 PM), https://twitter.com/Harris_X_/status/1251210281423908869 (illustrating Connectivity Expectations).

[115] HarrisX (@Harris_X_), TWITTER (Apr. 7, 2020, 12:40 PM), https://twitter.com/Harris_X_/status/1247565003013718019 (illustrating an American Work From Home Survey from March 16 2020 to Apr. 2, 2020).

[116] Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2019*, NATIONAL CENTER FOR HEALTH STATISTICS (Sept. 2020), https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202009-508.pdf?source=email.

[117] Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimate from the National Health Interview Survey, July-December 2018,* NATIONAL CENTER FOR HEALTH STATISTICS (Jun. 2019), https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201906.pdf?deliveryName=USCDC_374-DM4151.

[118] Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimate from the National Health Interview Survey, January-June 2019,* NATIONAL CENTER FOR HEALTH STATISTICS (May 2020), https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202005-508.pdf.

mobile data plans,[119] and CTIA's Annual Survey reported more than 299.5 million smartphones were in active use at the end of 2019, an increase of 15 million year-over-year.[120]

And subscriber data use continues to soar. In 2018, the average smartphone user consumed 6.6 GB per month.[121] In 2019, that number grew to 9.2 GB per month.[122] In addition to exponential growth in data, voice minutes and text messages also continue to increase year over year, and subsequently spiked beyond steady growth projections due to COVID-19.[123] The previously multi-million household jump in mobile-broadband-only households—from 10 percent of the U.S. population in 2016 to 12 percent in 2018[124]—further evidences the degree to which mobile broadband deployment continues to satisfy consumers' expectations.

Consumers across demographics benefit from the continued deployment and availability of next-generation mobile broadband. For instance, the smartphone-only trend is particularly pronounced among Hispanic, African American, young adult, and low-income consumers.[125] The Pew Research Center reported that 37 percent of U.S. adults said they "mostly" use a

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[119] *Digital Nation Data Explorer*, NTIA (Jun. 10, 2020) https://www.ntia.doc.gov/data/digital-nation-data-explorer#sel=mobileDataPlan&disp=map.

[120] Robert F. Roche and Sean McNicholas, *CTIA's Wireless Industry Indices Report, A Comprehensive Report from CTIA based on CTIA's Wireless Industry Survey Results, Year-End 2019 Results*, at 14 (Aug. 25, 2020).

[121] *2020 Annual Survey Highlights* at 9.

[122] *Id.*

[123] *Id.*

[124] *See .S. Census Shares New Broadband Adoption Data*, CONNECTED NATION. (measuring increase in number of U.S. households that have cellular data plans and no other internet subscription).

[125] *See Pew Mobile Broadband Report 2019* (smartphone-only users total 17 percent of U.S. adults overall, but 23 percent of African-Americans, 25 percent of Hispanics, and 26 percent of people with incomes under $30,000).

smartphone when accessing the internet.[126] This share has nearly doubled since 2013.[127] As Pew also notes, "[o]ne-quarter of Hispanics and a comparable share of blacks are smartphone only internet users, compared with about one-in-ten whites."[128] The wireless-only telephone trend is also more pronounced among Hispanic, young adult, and low-income consumers.[129]

Because mobile wireless broadband networks are expanding consistently and meeting or exceeding consumer demands and expectations, the Commission should find that mobile wireless broadband deployment is both reasonable and timely.

IV. THE COMMISSION SHOULD ENSURE MOBILE BROADBAND DEPLOYMENT REMAINS REASONABLE AND TIMELY BY PROMOTING ACCESS TO THE RESOURCES THAT SUPPORT THE NEXT-GENERATION SERVICES CONSUMERS DEMAND.

Over the course of the past year, the Commission has made great progress establishing and clarifying regulatory policies that promote investment, ensuring the reasonable and timely deployment of mobile broadband. To maintain this forward momentum, the Commission should act on the following recommendations.

A. The Commission Should Continue to Make Available Commercial Licensed, Exclusive-Use Spectrum to Support the Continued Reasonable and Timely Deployment of Mobile Broadband.

Access to the right combination of spectrum assets is the linchpin to ensuring robust competition in next-generation mobile wireless services, and access to critical mid-band

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[126] *Id.*

[127] *Id.*

[128] *Id.*

[129] Stephen J. Blumberg and Julian V. Luke, *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2019*, NATIONAL CENTER FOR HEALTH STATISTICS (Sept. 2020), https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202009-508.pdf?source=email.

spectrum for licensed use is a key part of that equation. According to a 2020 Analysys Mason report, on average, benchmark countries, including China, Japan, and the United Kingdom, are expected to have more than five times more licensed mid-band spectrum than the United States at the end of the year.[130]

Both the completion of the CBRS auction—which closed earlier this month[131]—and the upcoming C-Band auction[132] are indispensable parts of the path forward for providing critical mid-band airwaves. CTIA particularly supports the Commission's plans to auction 280 megahertz of spectrum in the 3.7–3.98 GHz band, and it is critical that this auction remain on track to begin in December.[133] Once winning bidders are identified, taking all appropriate steps to avoid delays in post-auction relocations and the issuance of licenses to winning bidders will be critical.

Beyond the auctions already scheduled for 2020, CTIA continues to urge the Commission to ensure that wireless service providers have access to the pipeline of mid-band spectrum they need to expand next-generation network deployments and support innovation. The Commission's plans to make available 100 megahertz of contiguous mid-band spectrum for commercial 5G deployment—consistent with the White House's and Department of Defense's

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[130] Janette Stewart *et al.*, *5G Mid-Band Spectrum Global Update*, ANALYSYS MASON (Mar. 2020) https://api.ctia.org/wp-content/uploads/2020/03/5G-mid-band-spectrum-global-update-march-2020.pdf.

[131] *Auction of Priority Access Licenses in the 3550-3650 MHz Band Closes, Winning Bidders Announced for Auction 105*, Public Notice, AU Docket No. 19-244, DA 20-1009 (rel. Sept. 2, 2020).

[132] *See generally Auction of Flexible-Use Service Licenses in the 3.7–3.98 GHz Band for Next-Generation Wireless Services; Notice and Filing Requirements, Minimum Opining Bids, Upfront Payments, and Other Procedures for Auction 107; Bidding in Auction 107 Scheduled to Begin December 8, 2020*, Public Notice, AU Docket No. 20-25, FCC 20-110 (rel. Aug. 7, 2020).

[133] *Id.*

call for exclusive access across a large portion of the country—is an excellent step in this direction.[134] The Commission should work expeditiously along with its federal partners to make this spectrum available for auction next year under a 5G-friendly framework, and it should further set the stage for this effort by adopting its proposal to remove the existing non-federal secondary Radiolocation and Amateur allocations in the 3.3–3.55 GHz segment and relocating incumbent non-federal operations. The Commission should also continue to work with its federal partners to ensure that any spectrum sharing proposals in the transition plans are more consistent with AWS-3 sharing regimes in order to ensure as much access as possible for 5G operations.

By taking advantage of this mid-band spectrum opportunity in the 3.45 GHz band while maintaining an eye toward making as much of the Lower 3 GHz band available for licensed, exclusive use as possible, the Commission will enable a win-win opportunity for commercial users and the federal government, all to the benefit of America's economy and consumers.

Indeed, as a recent CTIA study shows, clearing federal spectrum for commercial use helps federal agencies modernize their wireless operations and benefit from cutting-edge technologies.[135] As part of the AWS-1 and AWS-3 auctions, the Spectrum Relocation Fund has already transferred nearly $4.6 billion to federal agencies to upgrade their systems using other

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[134] *See Facilitating 5G in the 3.45-3.55 GHz Band*, Draft Report and Order and Further Notice of Proposed Rulemaking, FCC-CIRC2009-01, WT Docket No. 19-348 (draft rel. Sept. 9, 2020); *see also* Press Release, White House, *President Donald J. Trump Is Unleashing America's 5G Potential*, WHITEHOUSE (Aug. 10, 2020), https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unleashing-americas-5g-potential/.

[135] *Benefits from Clearing Federal Spectrum Helps Government Agencies Modernize Operations, New CTIA Paper Finds*, CTIA (Aug. 11, 2020), https://www.ctia.org/news/release-benefits-from-clearing-federal-spectrum-helps-government-agencies-modernize-operations-new-ctia-paper-finds.

spectrum—funding that enables transitions to modern, state-of-the-art digital systems, IP-based technologies, and fiber.[136]

B. The Commission Should Continue its Efforts to Remove Barriers to the Deployment of Wireless Infrastructure.

The Commission has done an excellent job reducing barriers to wireless infrastructure deployment, which has helped drive the above-described boom in infrastructure investment and deployment over the last few years.[137] CTIA particularly applauds the Commission for its recent efforts to facilitate the upgrade of existing sites for 5G networks by clarifying its rules regarding non-substantial deployments, which will help streamline access to existing wireless infrastructure.[138] The Commission's efforts to reduce barriers to wireless infrastructure deployment have had measurable results,[139] to the benefit of all. As Commissioner Brendan Carr has explained, "smart infrastructure policies . . . can flip the business case for thousands of communities."[140] Looking ahead, the Commission's continued efforts to further these very goals

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[136] *Repurposing Government Spectrum for Licensed Commercial Use: A Win-Win for Wireless Providers and Federal Agencies*, CTIA (Aug. 11, 2020) https://www.ctia.org/news/report-repurposing-government-spectrum-for-licensed-commercial-use

[137] The Commission's decisions have also withstood challenges, with the Ninth Circuit upholding the vast majority of two major 5G-enabling Commission policies *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, Declaratory Ruling and Third Report and Order, 33 FCC Rcd 9088 (2018), and *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, Third Report and Order and Declaratory Ruling, 33 FCC Rcd 7705 (2018)).. *City of Portland v. United States*, No. 18-72869 (9th Cir. Aug. 12, 2020).

[138] *Implementation of State and Local Governments' Obligation to Approve Certain Wireless Facility Modification Requests Under Section 6409(a) of the Spectrum Act of 2012*, Declaratory Ruling and Notice of Proposed Rulemaking, 35 FCC Rcd 5977 (2020).

[139] *See supra* Section II.

[140] Commissioner Brendan Carr, FCC, Keynote Address at the International Institute of Communications 2019 Telecommunications and Media Forum, "Building a 5G World" (Dec. 10, 2019), https://docs.fcc.gov/public/attachments/DOC-361292A1.pdf.

should include amending its rules to permit excavation or deployment of ground equipment outside the boundaries of an existing site in order to advance the objectives of Section 6409(a) of the 2012 Spectrum Act.[141] The Commission should also continue to work with its partners in the preservation community to resolve the long-outstanding Twilight Towers issue in order to make these existing structures available for collocation.

C. The Commission Should Ensure That a Properly Structured 5G Fund Can Enable Mobile Broadband Deployment in Unserved Rural Areas.

CTIA continues to share the Commission's focus on delivering mobile wireless services to unserved rural areas of the United States as an effective means of helping to ensure mobile broadband deployment remains reasonable and timely. Despite the extensive deployment of mobile broadband networks discussed above, some rural areas remain unserved—and the deployment of 5G services will require significant investment and resources. The 5G Fund can help fulfill the Commission's and wireless industry's goal of ensuring that rural Americans have reasonably comparable access to mobile wireless services.[142]

CTIA commends the Commission for its ongoing commitment to a high-cost universal service mechanism that is focused exclusively on mobile wireless services.[143] It is important that the key components of the 5G Fund, such as determining rural areas eligible for support and verifying network deployments, are aligned with the timing of other relevant Commission

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[141] *See, e.g.*, Reply Comments of CTIA, WT Docket No. 19-250, RM 11-849 (filed Aug. 3, 2020) (explaining how, by "promoting certainty and facilitating access to existing infrastructure, the revised rules will help balance local priorities while advancing the national interest in streamlining the deployment of new infrastructure needed to support 5G").

[142] *Establishing a 5G Fund for Rural America*, Notice of Proposed Rulemaking, GN. Docket. 20-32 (rel. April 24, 2020).

[143] *See*, Comments of CTIA, GN Docket. 20-32 (filed June 25, 2020).

proceedings, including the DODC. A properly structured and administered 5G Fund can help ensure that rural Americans benefit from the mobile broadband networks that will become the foundation of a new 5G economy.

D. The Commission Can Further Bolster Deployment by Maintaining Regulatory Flexibility and Streamlining Its Procedures.

The Commission can also further assist the continued reasonable and timely deployment of mobile wireless broadband by moving forward with regulatory actions already underway in a number of areas. First, the Commission should continue to provide a flexible regulatory approach as a general tactic in its proceedings, to encourage industry investment and innovation that will continue to deliver competitive mobile services to consumers. The U.S.'s 4G leadership and the benefits that resulted from it required years of diligent preparation, investment, and innovation from America's wireless industry—along with smart policies and regulatory frameworks. The Commission also should provide sufficient universal service support to ensure that Americans living in high-cost rural and insular areas have access to mobile wireless services. Consistent with CTIA's recent request, the Commission should also reform and streamline its rules and procedures governing *pro forma* assignments and transfers of control of Commission licenses.[144] These reforms are consistent with the record, the Commission's long-

[144] Petition of CTIA and USTelecom – The Broadband Association for Rulemaking and Declaratory Ruling to Streamline Federal Communications Commission Processes Regarding Non-Substantial Assignments of Licenses and Transfers of Control, WT Docket No. 20-186, RM-11860 (filed June 5, 2020); *Comment Sought on CTIA-USTelecom Petition for Rulemaking and Declaratory Ruling Regarding Certain Pro Forma Transactions*, Public Notice, WT Docket No. 20-186, RM-11860, DA 20-661 (rel. Jun. 24, 2020). Given the unanimous support in the record for the reforms proposed in the Petition across a broad range of industry sectors and public interest organizations, the Commission should quickly act on the Petition's proposals. *See*, *e.g.*, Comments of the American Consumer Institute Center for Citizen Research, WT Docket No. 20-186 (filed July 24, 2020); Comments of the Land Mobile Communications Council, WT Docket No. 20-186 (filed July 24, 2020); Comments of the National Association of Broadcasters, WT Docket No. 20-186, RM-11860 (filed July 24, 2020); Comments of the

standing view that *pro forma* assignments and transfers of control serve the public interest, and the Commission's efforts to streamline procedures so Commission staff and regulatees can make more efficient use of resources and better serve customers, invest in their networks and services, and promote competition.

V. CONCLUSION.

As the wireless industry continues to invest in and deploy mobile broadband, more consumers gain access to these advanced services than ever before. As continued growth in mobile data use, increasing mobile adoption and reliance, and world-leading network performance amidst a global pandemic all demonstrate, America's wireless providers are not only expanding mobile broadband coverage, but also enhancing their network capabilities to meet and exceed consumer demands. Accordingly, the Commission should find that the deployment of mobile broadband has been and continues to be reasonable and timely—and take further action to ensure it remains so.

Satellite Industry Association, WT Docket No. 20-186, RM-11860 (filed July 24, 2020).

Respectfully submitted,

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