

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
Inquiry Concerning Deployment of Advanced) GN Docket No. 22-270
Telecommunications Capability to All Americans)
in a Reasonable and Timely Fashion)

SEVENTEENTH SECTION 706 REPORT NOTICE OF INQUIRY

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By the Commission: Chairwoman Rosenworcel and Commissioner Starks issuing separate statements; Commissioners Carr and Simington concurring in part and issuing separate statements.

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I. INTRODUCTION

1. With this Notice of Inquiry (Notice), pursuant to section 706 of the Telecommunications Act of 1996, we initiate the next annual assessment concerning the “availability of advanced telecommunications capability to all Americans.”¹ We begin this annual inquiry in the wake of the

¹ 47 U.S.C. § 1302(b).

COVID-19 pandemic during which time Americans increasingly turned to their broadband connections to conduct their lives online by using telemedicine to access healthcare, working from home, attending classes remotely, connecting by video with out-of-town family and friends, and streaming entertainment. Our experiences with the pandemic made it clear that broadband is no longer a luxury but a necessity that will only become more important with time. Never before has the critical importance of ensuring that all Americans have access to high-speed, affordable broadband been more evident.

2. In light of the increasing uses and demands for high-speed broadband and the Congressional directives embodied in the Infrastructure Investment and Jobs Act (Infrastructure Act), which includes the largest ever federal investment in high-speed broadband,² we propose in this Notice to take a long overdue fresh look at our standards for evaluating broadband deployment and availability, the quality of our available data, and the framework that we use to make our finding under section 706. More specifically, we propose to focus our inquiry on the universal service goals of section 706—universal deployment, affordability, adoption, availability, and equitable access to broadband throughout the United States.

3. We also propose to make this inquiry our first to use the new Broadband Data Collection (BDC) data. The Commission's prior Broadband Deployment Reports have for many years relied primarily on the FCC Form 477 deployment data to evaluate consumers' broadband options for fixed and mobile services.³ In March 2020, Congress passed the Broadband DATA Act,⁴ which required the Commission, among other things, to collect biannual data relating to the availability and quality of service of fixed and mobile broadband Internet access service for the Commission to create broadband coverage maps.⁵ Pursuant to the Act, we now collect more precise, location-by-location broadband availability data through the BDC. Accordingly, in December 2022, the Commission sunset the collection of broadband deployment data through the FCC Form 477.⁶ The Commission completed its third round of BDC data collections on September 15, 2023. In this Inquiry, we will examine how these improvements to our data collection may impact the standards and inform our conclusions about broadband availability.

4. In response to this Notice, we seek objective data and other evidence to evaluate the universal service goals for broadband. We encourage individual consumers, providers of broadband services, consumer advocates, analysts, policy institutes, governmental entities, and all other interested parties to help us determine the most effective ways to complete this statutorily mandated task.

² Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021) (Infrastructure Act).

³ See, e.g., *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 20-269, *Fourteenth Broadband Deployment Report*, 36 FCC Rcd 836, 847-48, para. 21 (2021) (*2021 Report*); *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1677, para. 43 (2018) (*2018 Report*); *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*, GN Docket No. 15-191, 2016 Broadband Progress Report, 31 FCC Rcd 699, 729, para. 73 (*2016 Report*).

⁴ Broadband Deployment Accuracy and Technology Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) (codified at 47 U.S.C. §§ 641-646) (Broadband DATA Act).

⁵ 47 U.S.C. § 642(a)(1)(A).

⁶ *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Order, FCC 22-93 (Dec. 9, 2022) (*2022 Form 477 Order*) (sunsetting the collection of broadband deployment data through FCC Form 477). The Commission clarified that it will continue to collect broadband and voice subscription data using the FCC Form 477, but filers will submit their data through the BDC system. *Id.* at 1, para. 1.

II. STATUTORY STANDARD FOR THE SECTION 706 INQUIRY

5. Section 706 requires us to annually conduct an inquiry “concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms)” as part of an effort to “determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”⁷ If that determination is negative, the Commission “shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”⁸

6. Notably, for the first time since enacting section 706, Congress, in the Infrastructure Act, provided additional statutory text regarding the meaning of the provision. Specifically, Congress describes section 706 as setting out “the statutorily mandated goals of universal service for advanced telecommunications capability.”⁹ We therefore believe the Infrastructure Act supports the view that the Commission must determine whether advanced telecommunications capability is available universally throughout the country, or, in the words of the statute, “to *all* Americans.”¹⁰ We seek comment on this analysis. How should we apply it in the context of the statutory language that we must assess whether such capability “is being deployed to all Americans in a reasonable and timely manner”?¹¹ To what extent should the Commission evaluate the progress and pace of recent broadband deployment?

7. In addition, we note that the Infrastructure Act refers to section 706 as embodying “the statutorily mandated *goals* of universal service for advanced telecommunications capability,”¹² which we believe is best read to mean that the Commission’s inquiry must include an examination of multiple universal service goals and should not be limited to the narrow question of physical deployment of service. Although Congress did not define the terms “deployment” and “availability” as used in section 706, Congress stated that the Commission must assess the “availability” of advanced telecommunications capability, and it then directed that specific findings be made regarding “deployment.”¹³ Section 706 does not equate these two terms, and we therefore believe that in order to give meaning to both terms we have discretion in assessing “availability” to consider factors other than solely the state of “deployment.”¹⁴

⁷ *Id.*

⁸ *Id.* Since enacting section 706, Congress has shown a continued interest in improving the data and analysis the Commission uses in conducting its inquiry. In 2008, Congress made certain revisions to the Commission’s statutory directive based on a finding that “[t]he deployment and adoption of broadband technology has resulted in enhanced economic development and public safety for communities across the Nation, improved health care and educational opportunities, and a better quality of life for all Americans.” Broadband DATA Act, § 102(1); 47 U.S.C. § 1301(1). These revisions included clarifying that the inquiry must be annual and requiring the Commission to provide demographic information for unserved areas, including population density, per capita income, and median household income. See Broadband DATA Act § 103(a)(1), (3); 47 U.S.C. § 1302(b), (c). For an example of such demographic information, see *2021 Report*, 36 FCC Rcd at 860, para. 39, Fig. 5. As initially enacted, the Broadband DATA Act required the Commission to include in its annual inquiry a comparison between broadband deployment in the United States and at least 25 countries abroad. See Broadband DATA Act § 103(b). This comparison is no longer required for the section 706 inquiry but, instead, is included in the biannual Communications Marketplace Report. See 47 U.S.C. §§ 163, 1303(b)(1).

⁹ Infrastructure Act, div. F, tit. I, § 60104(c)(2).

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

¹¹ *Id.*

¹² Infrastructure Act, div. F, tit. I, § 60104(c)(2) (emphasis added).

¹³ *Id.*

¹⁴ 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*

(continued....)

Consistent with this discretion and the additional context provided by the Infrastructure Act, the Commission, in the Future of Universal Service Fund Report issued pursuant to the requirements of the Infrastructure Act, determined the broadband universal service goals of section 706 to be “universal deployment, affordability, adoption, availability, and equitable access to broadband throughout the United States.”¹⁵ We propose to use these same goals to conduct our section 706 inquiry and seek comment on this proposal.

III. DEFINING ADVANCED TELECOMMUNICATIONS CAPABILITY

8. We believe that it is time to take a fresh look at the standards that we use to determine what constitutes “advanced telecommunications capability.” In this section, we seek comment on the appropriate standards for evaluating the physical deployment of fixed and mobile broadband service, including proposing to increase our benchmark for fixed broadband download speed to 100 megabits per second (Mbps) and the upload speed to 20 Mbps, and the relationship between fixed and mobile broadband service.

A. Benchmarks for Advanced Telecommunications Capability

9. We seek comment on benchmarks to define advanced telecommunications capability for the purposes of evaluating section 706’s universal service goals for broadband. In addition to proposing an increase from the existing fixed broadband speed benchmark of 25/3 Mbps to 100/20 Mbps¹⁶ we seek comment on adopting a long-term fixed broadband speed goal of 1,000 Mbps, or 1 gigabit per second (Gbps), download speed paired with 500 Mbps upload speed. We also seek comment on whether we should adopt upload and download speed benchmarks for mobile service, and propose to include an assessment in our final report of the number of fixed and mobile broadband providers to which consumers have access.

1. Fixed Broadband Service

10. *Speed.* We propose to raise the download/upload speed benchmark for fixed broadband service to 100/20 Mbps. Congress confirmed the need to update this speed through passage of the Infrastructure Act that provides providing funding for broadband only when such service providers offer broadband service at speeds of at least 100 Mbps download and 20 Mbps upload. Specifically, the Infrastructure Act directed the National Telecommunications and Information Administration (NTIA) to establish the Broadband Equity, Access, and Deployment Program (BEAD Program), through which NTIA will allocate \$42.45 billion to states for grants “to bridge the digital divide.”¹⁷ Broadband networks funded by the BEAD Program must provide download speeds of at least 100 Mbps and upload speeds of at least 20 Mbps.¹⁸ Any areas that do not meet these requirements are considered underserved.¹⁹ In light

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Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10363, para. 27 (observing that these terms are broader than physical deployment).

¹⁵ *Report on the Future of the Universal Service Fund*, WC Docket No. 21-476, Report, FCC 22-67, at para. 12 (Aug. 15, 2022) (*USF Report*).

¹⁶ When we denote broadband speeds in formats such as 100/20 Mbps, we are presenting both the download and upload speeds. In the case of 100/20 Mbps, for example, we refer to broadband service that has a download speed of 100 Mbps and an upload speed of 20 Mbps.

¹⁷ Infrastructure Act, div. F, tit. I, § 60102(b)(1). On June 26, 2023, the BEAD Program allocations for all 50 states and the U.S. Territories were announced. National Telecommunications and Information Administration, U.S. Department of Commerce, *Biden-Harris Administration Announces State Allocations for \$42.45 Billion High-Speed Internet Grant Program as Part of Investing in America Agenda* (June 26, 2023), <https://www.ntia.gov/press-release/2023/biden-harris-administration-announces-state-allocations-4245-billion-high-speed>.

¹⁸ Infrastructure Act, div. F, tit. I, § 60102(h)(4)(A)(i).

¹⁹ Infrastructure Act, div. F, tit. I, § 60102(a)(1)(C)(ii).

of Congress' judgment that areas receiving broadband speeds of less than 100/20 Mbps are not adequately served, we believe that our speed benchmark for fixed advanced telecommunications capability must be updated to at least the 100/20 Mbps level.

11. Consumer use trends strongly suggest that Americans expect and need faster broadband connections. During the COVID-19 pandemic, families adapted to working, learning, receiving healthcare, and interacting with the outside world simultaneously using multiple devices on the same household connection. Higher speeds have frequently become a necessity. We believe many of the adaptations Americans made during the COVID-19 pandemic are here to stay—for example, more widespread teleworking and continued expansion of telehealth.²⁰ Indeed, households tend to subscribe to services meeting a 100 Mbps download speed threshold where it is available. For instance, the number of American households subscribing to services meeting a 100 Mbps download speed threshold increased from approximately 66.4 million in December 2019 to approximately 91.1 million in December 2022.²¹ As of December 2022, the mean download speed for all residential broadband subscriptions was 440 Mbps while the median residential download speed was 300 Mbps, and nearly 78% of all residential subscriptions had a download speed of at least 100 Mbps.²²

12. The COVID-19 pandemic increased the demand for faster broadband service, increased consumers' bandwidth needs, and increased the typical household's bandwidth usage. According to OpenVault, average U.S. household bandwidth consumption increased by approximately 71% between the end of 2019 and the end of 2022.²³ OpenVault also found that consumers are migrating to higher speed tiers, mainly due to an increase in subscribers working and learning from home, an increase in the number of devices accessing broadband services for longer periods of time, and an increase in the use of high-bandwidth applications such as videoconferencing and real-time e-learning.²⁴ In addition, many Internet service providers (ISPs) upgraded the speed provided to customers to accommodate their consumers' need for higher bandwidth services.²⁵ Even while customers are moving to higher speed tiers,

²⁰ See, e.g., U.S. Bureau of Labor Statistics, U.S. Business Response Summary (Mar. 22, 2023), <https://www.bls.gov/news.release/brs1.nr0.htm> (Bureau of Labor Statistics 3Q2022 Survey); GMMMA Staff Members, *Telehealth utilization and patient demand in 2023: Best guesses and best practices* (Nov. 3, 2022), <https://www.mgma.com/data/data-stories/telehealth-utilization-and-patient-demand-in-2023> (GMMMA Telehealth Survey).

²¹ Based upon staff evaluation of FCC Form 477 subscription data as of December 31, 2019 and December 31, 2022.

²² Based upon staff evaluation of FCC Form 477 subscription data as of December 31, 2022.

²³ See OpenVault, Broadband Insights Report 4Q 2022, at 4 (2023), <https://www.telecompetitor.com/clients/openvault/2022/Q4/index.php> (OpenVault 4Q2022 Report).

²⁴ See, e.g., *id.* at 8; OpenVault, Broadband Insights Report 4Q 2020 at 9 (2021), <https://openvault.com/resources/ovbi/> (OpenVault 4Q2020 Report).

²⁵ See, e.g., *Charter Launches Spectrum One, Offering Customers Unrivaled Connectivity and Value* (Oct. 31, 2022), <https://corporate.charter.com/newsroom/charter-launches-spectrum-one> (announcing the launch of Spectrum One for new and existing subscribers across all its markets with starting speeds of 300 Mbps); *Comcast Boosting Speeds for more than 20 Million Xfinity Internet Customers Across the Country* (Oct. 17, 2022), <https://corporate.comcast.com/press/releases/faster-internet-speeds-xfinity-customers-2022> (announcing upgraded speeds at all plan levels for customers in Xfinity's Northeast, Central, and West divisions); Eli Blumenthal, *AT&T is boosting the speeds of its Fiber home internet plans for new and existing users*, CNET (Apr. 28, 2021), <https://www.cnet.com/home/internet/at-t-is-boosting-the-speeds-of-its-fiber-home-internet-plans-for-new-and-existing-users/>; *Spectrum Continues to Double Internet Starting Speed to 200 Mbps* (Mar. 3, 2021), <https://corporate.charter.com/newsroom/spectrum-doubles-spectrum-internet-starting-speed-to-200-mbps-in-17-additional-markets>.

OpenVault observes that Internet users are increasingly pushing against the limit of the services to which they subscribe, using the vast majority of their available speed for much of the day.²⁶

13. More than three years since the COVID pandemic began, bandwidth consumption continues to increase steadily and shows no sign of stopping.²⁷ Telehealth has become an established method of providing and receiving healthcare, with one survey finding that 72% of medical groups expect patient demand for telehealth to stay the same or increase in 2023.²⁸ With regard to telework, a Bureau of Labor Statistics survey conducted in the third quarter of 2022 of private-sector establishments found that over 27% have some or all of their employees teleworking some or all of the time (with over 11% of respondents reporting that all of their employees teleworked all of the time), and over 95% expecting current levels of telework to stay the same over the next six months.²⁹ Similar to telehealth and telework, increased levels of online learning are likely to outlive the COVID-19 pandemic. For example, virtual school enrollment across ten states increased 176% in the 2021-22 school year, as compared to the 2019-20 school year.³⁰ And even students who are attending school in person are still relying on home connectivity for schoolwork outside of school hours.³¹ We seek comment on these trends and the foregoing views.

14. The Commission's Universal Service Fund efforts to deploy broadband also support an increase in the speed benchmark for what is considered advanced telecommunications capability. In recent years, the Commission has awarded high-cost universal service support almost exclusively to projects with broadband service at speeds of 100/20 Mbps or faster. All recipients of the Bringing Together Puerto Rico Stage 2 fixed support program, for example, are required to provide service at a minimum speed of 100/20 Mbps, with service obligations at some locations as high as 1 Gbps/500 Mbps.³² In addition, 1 Gbps/500 Mbps service will have to be deployed to all locations subject to

²⁶ OpenVault, Broadband Insights Report 3Q 2021 at 9-11 (2021), <https://openvault.com/resources/ovbi/> (*OpenVault 3Q2021 Report*).

²⁷ See generally *OpenVault 4Q2022 Report*.

²⁸ *GMMA Telehealth Survey* (Nov. 3, 2022), <https://www.mgma.com/data/data-stories/telehealth-utilization-and-patient-demand-in-2023>; Tanya Albert Henry, *Millions of Medicare Patients Kept Telehealth Habit Post-Vaccines*, AMA (Feb. 6, 2023), <https://www.ama-assn.org/practice-management/digital/millions-medicare-patients-kept-telehealth-habit-post-vaccines> (finding that about 4 million Medicare patients received medical care through telehealth in each of the first two quarters in 2022); Jiang Li, *Telemedicine And Telehealth In 2023 And Beyond: From Leveling Out To Leveling Up* (Dec 27, 2022), <https://www.forbes.com/sites/forbestechcouncil/2022/12/27/telemedicine-and-telehealth-in-2023-and-beyond-from-leveling-out-to-leveling-up/?sh=5a02ef654843>; FAIR Health, *Monthly Telehealth Regional Tracker*, <https://www.fairhealth.org/fh-trackers/telehealth>.

²⁹ See *Bureau of Labor Statistics 3Q2022 Survey*. See also Jennifer Liu, *More Americans are Now Working Fully Remote than 3 Months Ago, Despite Fewer WFH Job Openings*, CNBC (Feb. 13, 2023) <https://www.cnbc.com/2023/02/13/remote-work-ticked-up-in-january-and-could-signal-the-future-of-wfh.html> (noting that 46 percent of respondents in a January 2023 LinkedIn survey are working a hybrid or remote schedule); Kim Parker, *About a Third of U.S. Workers Who Can Work From Home Now Do So All the Time*, Pew Research Center (Mar. 30, 2023) <https://www.pewresearch.org/fact-tank/2023/03/30/about-a-third-of-us-workers-who-can-work-from-home-do-so-all-the-time/> (finding that 59 percent of hybrid workers work from home three or more days in a typical week).

³⁰ Asher Lehrer-Small, *Virtual School Enrollment Kept Climbing Even As COVID Receded, New Data Reveal*, The 74 (Nov. 14, 2022), <https://www.the74million.org/article/virtual-school-enrollment-kept-climbing-even-as-covid-receded-new-data-reveal/> (updated Nov. 16, 2022).

³¹ CoSN, *CoSN Releases Findings of 2022 Home Connectivity Study* (July 14, 2022), <https://www.cosn.org/cosn-news/cosn-releases-findings-of-2022-home-connectivity-study/>.

³² See *Wireline Competition Bureau Authorizes Stage 2 Support for Puerto Rico Telephone Company and Liberty Communications of Puerto Rico*, WC Docket Nos. 18-143 and 10-90, Public Notice, 36 FCC Rcd 9914 (WCB 2021) (continued....)

Connect USVI Stage 2 fixed support in the U.S. Virgin Islands.³³ Rural Digital Opportunity Fund auction winners that have been announced as ready to authorize as of January 2023 have committed to providing 1 Gbps/500 Mbps service to roughly 98% of locations being funded.³⁴

15. In addition, numerous states and executive agencies have set broadband download speed targets of at least 100 Mbps. Many states have developed broadband deployment programs requiring funded projects to deliver speeds at or exceeding this threshold benchmark.³⁵ At least one state has set 100 Mbps as a goal for all state programs and at least one other has made 100 Mbps an official standard for multiple state programs.³⁶ The U.S. Department of Agriculture's Rural Utilities Service (RUS) provides broadband loans with a set of minimum speed requirements, which vary based on the duration of the project. For 5-10 year award terms, which are comparable to the term of support for many high-cost

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(Bringing Together Puerto Rico Winning Applicant Announcement) (identifying Puerto Rico Telephone Co., Inc. (PRTC) and Liberty Communications of Puerto Rico (Liberty) as the winning applicants); PRTC Uniendo a Puerto Rico Fund Stage 2 Fixed Support Application Form, WC Docket Nos. 18-143 and 10-90, Initial Overview at 1 (filed June 22, 2021) (*PRTC Network Description*); Liberty Uniendo a Puerto Rico Fund Stage 2 Fixed Support Application Form, WC Docket Nos. 18-143 and 10-90, Initial Overview at 4 (filed June 22, 2021) (*Liberty Network Description*). We refer to the *Bringing Together Puerto Rico Winning Applicant Announcement*, *PRTC Network Description*, and *Liberty Network Description* together as the *Bringing Together Puerto Rico Broadband Speed Requirements*.

³³ See *Connect USVI Fund Stage 2 Support Authorized for Broadband VI*, WC Docket Nos. 18-143 and 10-90, Public Notice, 36 FCC Rcd 9405 (WCB 2021) (*USVI Fund Winning Applicant Announcement*) (identifying Broadband VI as the winning applicant); Broadband VI Uniendo a Puerto Rico Fund Connect USVI Fund Stage 2 Fixed Support Application Form, WC Dockets Nos. 18-143 and WC 10-90, Initial Overview at 1 (filed June 11, 2021) (together with the *USVI Fund Winning Applicant Announcement*, the *USVI Fund Broadband Speed Requirements*).

³⁴ See FCC, *Auction 904: Rural Digital Opportunity Fund*, <https://www.fcc.gov/auction/904> (Results tab, last visited Oct. 23, 2023).

³⁵ See, e.g., Iowa Department of Management, Empower Rural Iowa Broadband Grant Program Notice of Funding Availability at 4 (2023), https://ocio.iowa.gov/sites/default/files/exhibit_a_-_notice_of_funding_availability_-_nofa_008.pdf (Iowa Program) (offering definitions only for 100/100 and 100/20 broadband in grant funding notice); Maine Connectivity Authority, Broadband Service Triennial Strategic Plan 2022-24 (2022), https://www.maine.gov/connectme/sites/maine.gov.connectme/files/inline-files/Plan_Triennial_2022.pdf (declaring 25 Mbps/3 Mbps insufficient and “designat[ing] broadband service as 100/100mbps”); Maryland Department of Housing and Community Development, Connect Maryland: FY23 Network Infrastructure Grant Program: Request for Applications at 6 (2022), <https://dhcd.maryland.gov/Broadband/Documents/FY23NIGP/ApplicationPackage.pdf> (Maryland Program) (defining “broadband service” as providing “the minimum data rate of one hundred (100) megabits per second downstream and twenty (20) megabit per second upstream”); Michigan Department of Labor and Economic Opportunity, Realizing Opportunities with Broadband Infrastructure Networks (ROBIN) Grant Program Guidance at 2 (2023), https://www.michigan.gov/leo/-/media/Project/Websites/leo/Documents/MIHI/ROBIN-Grant/ROBIN_Program_Guidance.pdf (Michigan Program) (defining “broadband service” as supporting “a symmetrical rate of at least 100 megabits per second downstream and upstream”); Miss. Code Ann. § 77-19-3(b) (defining “broadband service” as mass-market retail service at speeds of at least 100/20 Mbps); North Dakota Legislative Branch, 2018-2019 Annual Report, Appendix at 8 (2019), https://www.legis.nd.gov/files/committees/66-2019/21_5124_03000appendixj.pdf (noting that their objective is statewide Gigabit connectivity and that “more than 75% of North Dakotans already have access to Gigabit broadband delivered in more than 325 communities”); Washington State Department of Commerce, *CERB Rural Broadband Program*, <https://www.commerce.wa.gov/building-infrastructure/community-economic-revitalization-board/rural-broadband/> (last visited Oct. 23, 2023) (Washington Program) (setting speed benchmarks for broadband provided via cable modem, powerlines, and microwave at 100/20 Mbps, 100/100 Mbps, and 100/20 Mbps, respectively).

³⁶ California Broadband Council, Broadband Action Plan 2020 at 20 (2020), <https://broadbandcouncil.ca.gov/wp-content/uploads/sites/68/2020/12/BB4All-Action-Plan-Final-Draft-v26.pdf> (setting 100 Mbps as a goal); Neb. Rev. Stat. §§ 86-135(1), 86-324(1), 86-5, 109, 86-1302(11).

Universal Service broadband programs,³⁷ the RUS requires awardees to provide service at a minimum speed of 100/12 Mbps.³⁸ In addition, the U.S. Department of Treasury, as part of its implementation of the American Rescue Plan Act’s provisions relating to broadband infrastructure funding,³⁹ has adopted a requirement that projects to be designed to deliver service that reliably meets or exceeds 100/100 Mbps.⁴⁰ Further, the Commission’s Precision Agriculture Task Force in 2021 advocated increasing the Commission’s benchmark speed to 100/20 Mbps, explaining that the current benchmark is too low to enable sufficient innovation and utilization of precision agriculture and for purposes of transferring large amounts of data from field or farm to the cloud for storage.⁴¹

16. Most of the nation’s largest ISPs focus their marketing efforts on fixed broadband speeds of at least 100 Mbps download. For example, the slowest Internet speed plan marketed by Charter is 300 Mbps.⁴² In addition, Verizon appears to market three tiers of fixed service with discounts for low-income customers, with the slowest tier being 300 Mbps.⁴³ Google Fiber appears to market only 1 and 2 Gbps service.⁴⁴

17. Deployment trends also suggest that raising the benchmark is a reasonable course of action. According to December 2022 BDC data, approximately 91% of broadband-serviceable locations had access to a terrestrial fixed broadband service with download speeds of at least 100 Mbps in December 2022.⁴⁵ FCC Form 477 deployment data showed that since 2017, more than 90% of the population has had access to terrestrial fixed broadband service with download speeds of at least 100 Mbps, with that percentage increasing to 95.1% by December 2021.⁴⁶

³⁷ See, e.g., 47 CFR § 54.309(a)(2)(ii) (10-year term for CAF Phase II Auction Support); 47 CFR § 54.802(b) (10-year term for Rural Digital Opportunity Fund); 47 CFR § 54.1504(a) (10-year term for Stage 2 fixed support under the Bringing Together Puerto Rico and Connect USVI Funds).

³⁸ See Department of Agriculture, Rural Broadband Loans, Loan/Grant Combinations, and Loan Guarantees, 85 Fed. Reg. 14393, 14396 (Nov. 30, 2022) (noting that the RUS’s broadband lending speed benchmark is currently set at 25/3 Mbps); 7 CFR § 1738.55(a)(2) (requiring projects with an award term of 5-10 years to provide service at a benchmark of “four times the broadband lending speed,” which equates to a benchmark of 100 Mbps in download speed for such loans).

³⁹ American Rescue Plan Act of 2021 (ARPA) Pub. L. No. 117-2, § 9901 (codified at 42 U.S.C. § 802(c)(1)(D)).

⁴⁰ The Department of Treasury initially adopted this requirement as an interim final rule, 31 CFR § 35.6(e)(2), and the requirement is scheduled to become a final rule on April 1, 2022. See Department of the Treasury, Coronavirus State and Local Fiscal Recovery Funds, 87 Fed. Reg. 4338 (Jan. 27, 2022) (*ARPA Final Rule*). Both the interim and final rule state that if providing an upload speed of 100 Mbps “is not practicable, because of the excessive cost of the project or geography or topography of the area to be served by the project,” recipients are permitted to deploy service at an upload speed of 20 Mbps, so long as the upload speed is scalable to 100 Mbps. 31 CFR § 35.6(e)(2), *ARPA Final Rule*.

⁴¹ Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States, Report of the Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States at 6 (2021), <https://www.fcc.gov/sites/default/files/precision-ag-report-11102021.pdf>.

⁴² Charter Communications, *Spectrum Internet Speeds*, <https://www.spectrum.com/internet> (last visited Oct. 23, 2023) (Charter Communications provides broadband service under the brand Spectrum).

⁴³ Verizon, *Get free Verizon Home Internet with ACP and the Verizon Forward Program*, <https://www.verizon.com/home/acp/free-internet/> (last visited Oct. 23, 2023) (see “Prices with programs applied”).

⁴⁴ *Choose the speed you need — from the 1 Gig we're known for to the fastest we've ever offered*, <https://fiber.google.com/internet/> (last visited Oct. 23, 2023).

⁴⁵ Staff calculations based on December 31, 2022, data from the BDC.

⁴⁶ Based upon staff evaluation of FCC Form 477 Data from December 31, 2017, through December 31, 2021. These figures include all 50 States, the District of Columbia, and Puerto Rico. Evaluation of data is based on 2010 census geographies for 2017 through 2020 and 2020 census geographies for 2021. The population data are based upon the

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18. In addition to raising our download speed benchmark to 100 Mbps, we also believe it is time to raise the current 3 Mbps upload speed benchmark for fixed services to 20 Mbps. Broadband funding programs have evolved not only to expect faster download speeds, but faster upload speeds, as well. For example, the BEAD Program requires an upload speed of 20 Mbps and winning bidders in the Bringing Puerto Rico Together and USVI Fund programs are committed to providing minimum upload speeds of 20 and 500 Mbps, respectively.⁴⁷

19. Moreover, consumer subscription patterns and usage trends indicate that upload speed is increasingly important. The pandemic has taught us all the importance of upstream broadband transmission speeds. This is borne out by the subscription patterns and consumer uses discussed above that support not only increasing the download speed benchmark, but also the upload speed benchmark. Based on OpenVault's data, average household monthly upload broadband usage increased over 40% faster than download usage increased between December 2019 and December 2022.⁴⁸ Multiple household members simultaneously using today's applications may often need more than 3 Mbps. A 2021 study conducted by the Consortium for School Networking (CoSN) concluded that 3 Mbps is an inadequate upload speed to support even a single student in a household, let alone multiple students in the same household.⁴⁹ Instead, CoSN recommends a per-student benchmark upload speed of 12 Mbps.⁵⁰ Zoom suggests 1.2 Mbps upload for a single 720p one-on-one video call and far more for higher quality video (3.8 Mbps) and video calls with groups of people (2.6-3.8 Mbps).⁵¹ Thus it appears that in many instances, simultaneous use of telework, telehealth, remote learning, or personal video calling would outstrip a 3 Mbps upload capability. A 20 Mbps upload speed benchmark is not only consistent with the threshold set by the Infrastructure Act,⁵² it will better accommodate increased usage patterns and bandwidth-intensive applications that require greater upload capacity.

20. We seek comment on our proposal to adopt 100/20 Mbps as the benchmark speed for fixed broadband service to constitute "advanced telecommunications capability." Do commenters agree that the changes in telehealth, work, and e-learning patterns, the market behavior of consumers and ISPs, and recent policy developments requiring higher speed services necessitate a speed benchmark of at least 100/20 Mbps to satisfy the definition of "high-speed, switched, broadband telecommunications capability

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Commission staff's population estimates. FCC, *Staff Block Estimates*, <https://www.fcc.gov/staff-block-estimates> (last visited Oct. 23, 2023).

⁴⁷ Infrastructure Act, div. F, tit. I, § 60102(h)(4)(A)(i); *Bringing Together Puerto Rico Broadband Speed Requirements*; *USVI Fund Broadband Speed Requirements*. Multiple state programs also require upload speeds of at least 20 Mbps. See, e.g., Iowa Program (20 Mbps), Maryland Program (20 Mbps), Michigan Program (100 Mbps), Washington Program (20 Mbps).

⁴⁸ See *OpenVault 4Q2022 Report* at 15; *OpenVault 4Q2020 Report* at 7. OpenVault reports average monthly download bandwidth consumption was 551.4 GB in December 2022, compared to 344 GB in December 2019 (a roughly 60% increase), while it reports average monthly upload bandwidth consumption was 35.3 GB in December 2022, compared to 19 GB in December 2019 (a roughly 86% increase).

⁴⁹ Consortium for School Networking, *Student Home Connectivity Study*, at 8 (2021), https://emma-assets.s3.amazonaws.com/paqab/37cf06d0de533f59eb780f4ec065d766/Home_Connectivity_Study_Report_5.3.21_FINAL.pdf.

⁵⁰ *Id.*

⁵¹ Zoom, *Zoom system requirements: Windows, macOS, Linux*, <https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-Windows-macOS-and-Linux> (last visited Oct. 23, 2023). Microsoft recommends 1.5 Mbps upload for a single 720p one-on-one video call, 4.0 Mbps for higher quality video (3.8 Mbps), and 2.5-4.0 for video calls with groups of people using Teams, which Microsoft states "is always conservative on bandwidth utilization." Microsoft, *Prepare your organization's network for Microsoft Teams*, <https://learn.microsoft.com/en-us/microsoftteams/prepare-network> (last visited Oct. 23, 2023).

⁵² See Infrastructure Act, div. F, tit. I, § 60102(a)(1)(C)(ii), (h)(4)(A)(i).

that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology”⁵³ Do commenters believe a different speed benchmark is appropriate, and if so, why? Should the benchmark be set at an even higher speed? If so, why? Would increasing the benchmark have any effect on broadband competition? For instance, if the benchmark was increased to 100/20 Mbps, would that artificially reduce the appearance of competition by limiting the number of providers or technologies that the Commission reports as providing advanced telecommunications capability?

21. Is it necessary for the Commission to examine particular consumer use cases in selecting a speed benchmark? If so, what do such use cases demonstrate? We seek comment on the online applications, use cases, and technologies that commenters believe a sufficient number of consumers are using today and will use in the foreseeable future. How can the Commission set relevant speed and other broadband thresholds to enable those applications, use cases, and technologies? For example, as 4K video increases in popularity, individual households may have an increasing number of 25 Mbps video streams serving applications such as video conferencing, telehealth, and remote learning, not to mention streaming of video entertainment and gaming.⁵⁴ Graphics-intensive telework, alone, can require 45 Mbps or more.⁵⁵ We believe that in examining household use cases, a simple summation of required speeds for individual activities may provide a misleading picture of actual broadband needs for at least three reasons. First, we believe it is appropriate to take into account at least occasional downloads of very large files which can be bandwidth-intensive.⁵⁶ Second, it is important to account for larger households; in 2022, approximately 21% of all U.S. households had four or more people, and the number of families seeking out multigenerational homes to live with additional relatives rose.⁵⁷ Households of all sizes must have sufficient bandwidth to satisfy their needs. In addition, the number of connected devices per household continues to grow, from 18.6 in the average household in 2021 to 20.2 in the first half of 2022.⁵⁸ Taking these factors into account suggests that fixed broadband download/upload needs could easily exceed 100/20 Mbps. We seek comment on these views.

⁵³ See 47 U.S.C. § 1302(d)(1).

⁵⁴ Some recommend 25 Mbps download speed for streaming 4K video. See, e.g., Anthony Spadafora, *What internet speed do I need? Here's how many Mbps is enough*, https://www.tomsguide.com/us/internet-speed-what-you-need_news-24289.html (last visited Oct. 23, 2023); *Find movies with 4K, HDR, Dolby Vision, or Dolby Atmos in the Apple TV app*, <https://support.apple.com/en-us/HT207949>, (last visited Oct. 23, 2023). But see, Google, *System requirements & supported devices for YouTube*, <https://support.google.com/youtube/answer/78358?hl=en> (last visited Oct. 23, 2023) (*YouTube Video Bandwidth Recommendations*) (recommends 20 Mbps); Netflix, *Internet connection speed recommendations*, <https://help.netflix.com/en/node/306> (last visited Oct. 23, 2023) (recommends 15 Mbps).

⁵⁵ Fast Feed Editorial Staff, *How To Get the Fastest Internet in a Home Office* (Mar. 12, 2020), <https://blog.frontier.com/2020/03/how-much-speed-do-you-need-to-do-your-job-from-home/>; see also Chantel Buchi, *The Best Internet Setup for Working from Home* (Sept. 26, 2023), <https://www.reviews.org/internet-service/work-from-home-internet-guide/> (recommending 100 Mbps for “most” teleworkers”).

⁵⁶ Morgan Park, *The era of 100GB games is upon us, and the average PC gamer is underprepared*, PC Gamer (May 12, 2023), <https://www.pcgamer.com/the-era-of-100gb-games-is-upon-us-and-the-average-pc-gamer-is-underprepared/>; RJ Pierce, *Why Are Games Getting MASSIVE Install Sizes? Here's a Tech Explainer*, Tech Times (Sept. 2, 2021), <https://www.techtimes.com/articles/264914/20210902/why-games-getting-massive-install-sizes-heres-tech-explainer.htm>. At 25 Mbps, it would take roughly nine hours to download 100 GB.

⁵⁷ U.S. Bureau of the Census, *Historical Households Tables*, <https://www.census.gov/data/tables/time-series/demo/families/households.html> (Nov. 2022) (Table HH.4 Households by Size: 1960 to Present); Oyin Adedoyin, *More Parents are Moving In With Adult Children – at Younger Ages*, Wall Street Journal, (Feb. 22, 2023) <https://www.wsj.com/articles/more-parents-are-moving-in-with-adult-children-at-younger-ages-a931f3d7> (reporting that 14% of all home buyers in 2022 set up multigenerational homes, up from 11% in 2021).

⁵⁸ Plume, *Smart Home Market Report at 7* (2022), <https://discover.plume.com/plume-iq-smart-home-1h-2022-smart-home-report.html>.

22. Given the increasing importance of upload speed, is there a continuing reason to differentiate download and upload speeds in our benchmark or should we consider setting a benchmark with symmetrical download and upload speeds? Are the demands of upload broadband uses growing at a rate at which they may soon be the same as download demands? We recognize that, to some degree, the potential need for a symmetrical benchmark depends on where the benchmark is set—whether, for example, it is 500/500 Mbps or 100/100 Mbps. Rather than adopt a speed benchmark of 100/20 Mbps as proposed, is there sufficient cause to instead adopt a symmetrical benchmark of 100/100 Mbps? Are the arguments against the adoption of a symmetrical benchmark of 100/100 Mbps sufficient to outweigh the attendant benefits to users and the country at large of establishing such a speed threshold? For example, would a symmetrical benchmark adversely affect competition by minimizing other technologies or providers that can provide non-symmetrical download speeds but that might otherwise satisfy consumer demands?

23. Regardless of the benchmark that we select for fixed broadband service, we believe it is valuable for fixed providers to report on a wide range of download speeds and, in addition, multiple upload speeds for each download speed. We invite commenters to suggest what they consider relevant combinations of benchmark download and upload speeds that we should report for both fixed and mobile broadband service. As part of their suggestions, we request that commenters consider the availability of reliable and comprehensive data and suggest available sources.

24. We also seek comment, consistent with a recent recommendation by the Government Accountability Office (GAO), on means by which we could make our current and future consideration of our benchmark for fixed broadband service as consistent and transparent as possible.⁵⁹ What steps could we take that the Commission has not taken before to explain the scope and steps of its research and analysis, the data and analysis used to support our assertions, and the rationale for why we agree or disagree with stakeholder comments that we receive?⁶⁰

25. *Small Business Needs.* We seek comment on what needs of small businesses should be taken into consideration in our determination of a new speed benchmark. The GAO recommended that the Commission solicit input from stakeholders, conduct analysis of small business broadband needs and incorporate the results of this analysis into its determination of the benchmark speed for broadband.⁶¹ We agree with GAO that soliciting additional stakeholder input regarding small business broadband needs, assuming adequate data are available, could assist the Commission in determining whether the current fixed speed broadband benchmark is adequate to deliver “advanced telecommunications capability.” GAO’s view is that the current minimum benchmark speed of 25/3 Mbps is likely not fast enough to meet the needs of small businesses, particularly with regard to upload speeds.⁶² Do commenters agree? What are the needs of small businesses with respect to broadband that the Commission should take into account in determining a speed benchmark?

26. *Long-Term Speed Goal.* In evaluating broadband deployment, we must not only look at the present, but also to the future. We therefore seek comment on adoption of a long-term speed goal for fixed broadband service, with a benchmark of 1 Gbps/500 Mbps, a speed adopted for many locations in recently-established Commission Universal Service Fund programs.⁶³ Establishing a long-term goal

⁵⁹ See U.S. Government Accountability Office, FCC Should Improve Its Communication of Advanced Telecommunications Capability Assessments at 19 (2023), <https://www.gao.gov/assets/gao-23-105655.pdf> (GAO *Small Business Report*).

⁶⁰ *Id.*

⁶¹ See U.S. Government Accountability Office, FCC Should Analyze Small Business Needs at 27 (2021), <https://www.gao.gov/assets/gao-21-494.pdf>.

⁶² *Id.* at 26.

⁶³ See, e.g., *Bringing Together Puerto Rico Broadband Speed Requirements; USVI Fund Broadband Speed Requirements; Rural Digital Opportunity Fund Report and Order*, 35 FCC Red at 702-03, para. 3.

could not only give notice to policymakers and market participants as to how advanced telecommunications capability is likely to be defined in the near future, but also give all parties, government and industry alike, a collective goal toward which to strive—a better, faster, more robust system of communication for American consumers. Although, as we discuss above, some states have standards faster than 25/3 Mbps for policymaking purposes, it appears that some states may still be using 25/3 Mbps as their standard for some programs.⁶⁴ While funding recipients may well dramatically exceed such benchmarks, we are concerned that our lack of a long-term goal may be sending an inappropriate signal to other policymakers. In light of these considerations, we seek comment on whether 1 Gbps/500 Mbps is an appropriate long-term goal. Would an aspirational standard encourage deployment? Should we adopt such a long-term benchmark? How should we define “long-term”? We note that the length of support for many Commission high-cost programs is 10 years.⁶⁵ Would a different speed than 1 Gbps/500 Mbps be a more appropriate long-term benchmark? We seek comment on the online applications, use cases, and technologies that commenters believe consumers may use that would be supported by this long-term benchmark. Should we adopt a symmetrical long-term benchmark?

27. *Service Quality.* We recognize that other factors, besides the speed of a broadband connection, can affect consumers’ ability to use the services effectively. Chief among these factors is latency, which is the measure of the time it takes a packet of data to travel from one point in the network to another, and which is typically measured by round-trip time in milliseconds (ms).⁶⁶ As a measurement of advanced telecommunications capability, latency can be critical because it affects a consumer’s ability to use real-time applications, including voice over Internet Protocol, video calling, distance learning applications, and online gaming.⁶⁷ Actual (as opposed to advertised) speed received, consistency of speed, and data allowances are also important.⁶⁸ Such factors are not simply a matter of service interruptions and consumer satisfaction—they have a real and significant effect on Americans’ ability to use critical web-based applications, including those that facilitate telehealth, telework, and virtual learning.

⁶⁴ See, e.g., Georgia Code § 50-40-1(2), 50-40-2(a) (defining “broadband services” for purposes of “state-wide efforts to promote and facilitate deployment of broadband services” as services with a capability to transmit at a minimum speed of 25/3 Mbps); Business Oregon, *Rural Broadband Capacity Program*, https://www.oregon.gov/biz/aboutus/boards/bac/Pages/Rural_Broadband_Capacity_Pilot_Program.aspx (last visited Oct. 23, 2023) (permitting grants to fund construction of broadband infrastructure capable of delivering service at speed of at least 25/3 Mbps). At least two states tie the speed requirements for at least one of their programs to the Commission’s benchmark (to change as the Commission’s benchmark changes). See Minn. Stat. § 116J.394(b) (citing, in turn, Minn Stat. § 116J.39(b)); State of West Virginia, West Virginia Broadband Infrastructure Loan Insurance Guide at 5 (2018), <https://broadband.wv.gov/assets/files/pdfs/inner-pages/loan-insurance/WVEDA-Loan-Insurance-Guide-and-Form-2018.11.9.pdf>.

⁶⁵ See, e.g., 47 CFR §§ 54.802(a) (Rural Digital Opportunity Fund), 1504(a) (Bringing Together Puerto Rico and Connect USVI Funds).

⁶⁶ *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*, GN Docket No. 15-191, Eleventh Broadband Progress Notice of Inquiry, 30 FCC Rcd 8823, 8835, para. 32 (2016).

⁶⁷ *Id.* at 8835, para. 32 n.69. High latencies may affect the perceived quality of some interactive services such as phone calls over the Internet, video chat and video conferencing, or online multiplayer games. FCC, Measuring Broadband America Fixed Broadband Report at 1.C (2023), [https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-twelfth-report#:~:text=The%20Twelfth%20Measuring%20Broadband%20America,Broadband%20America%20\(MBA\)%20\(Twelfth%20Measuring%20Broadband%20America%20Report\)](https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-fixed-broadband-twelfth-report#:~:text=The%20Twelfth%20Measuring%20Broadband%20America,Broadband%20America%20(MBA)%20(Twelfth%20Measuring%20Broadband%20America%20Report).). By consistency of speed, we refer to the extent to which the speed received by a consumer fluctuates over a period of time. See *id.* at 2.C.

⁶⁸ Certain metrics may be combined. For example, we could measure the minimum speed that a consumer actually receives 99.999% of the time.

28. Given these considerations regarding service quality, we seek comment on whether and to what extent we should consider these factors in making our determination pursuant to section 706. Should we establish concrete benchmarks by which to judge such factors? Broadband networks funded by the BEAD Program must provide “latency that is sufficiently low to allow reasonably foreseeable, real-time, interactive applications.”⁶⁹ Should we adopt the same or similar standard by which to judge latency or quality of service, generally? Are the limitations of a provider’s customer-premises equipment (CPE), such as modems and routers, relevant in determining where to set any such benchmarks and, if so, how? How should we account for deficiencies in CPE that consumers themselves may provide? Are there other factors, beyond latency, such as actual versus advertised speed, and consistency of speed, that we should consider in making our determination pursuant to section 706? Should we consider packet loss as part of this inquiry? Are there other service quality metrics that we should consider? To what extent should such considerations affect our eventual finding of whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion?

29. We also seek comment on whether the available quality of service data are sufficient to establish quantifiable benchmarks for factors such as latency and consistency. Is there sufficient information available to allow us to set benchmarks that govern service quality and to determine whether these thresholds are being met? For instance, do these studies and data collections, such as Measuring Broadband America,⁷⁰ have sufficient representation by providers across the nation to accurately address the question of whether providers have achieved the prescribed levels of latency and consistency? Might a lack of sufficient quality of service data support the adoption of a less quantitative and more qualitative standard, such as that adopted for the BEAD Program?⁷¹

2. Mobile Broadband Service

30. *Speed.* The Commission has not adopted a mobile advanced telecommunications capability benchmark in previous reports primarily due to the inherent variability in the performance characteristics of mobile service, both geographically and temporally.⁷² Rather, the Commission has evaluated the deployment of advanced telecommunications capability for mobile services using multiple metrics. For example, in previous reports, the Commission has analyzed FCC Form 477 4G LTE coverage data, where mobile service providers reported a minimum advertised or expected speed of 5/1 Mbps, and then supplemented these provider-reported data with Ookla speed test data.⁷³ In particular, in those areas where providers claimed to provide 4G LTE with a minimum 5/1 Mbps advertised (or expected) speed, the Commission supplemented these data with Ookla speed-test data showing median speed tests of at least 10/3 Mbps, to help the Commission understand the extent to which American consumers were receiving mobile speeds higher than 5/1 Mbps.⁷⁴

⁶⁹ Infrastructure Act, div. F, tit. I, § 60102(h)(4)(A)(i).

⁷⁰ See, e.g., *Twelfth Measuring Broadband America Report*. The participants for the most recent report were Altice Optimum, CenturyLink, Charter, Cincinnati Bell, Comcast, Cox, Frontier, Mediacom, Verizon (fiber), and Windstream. *Id.* at 2.A. AT&T no longer participates in the program. *Id.*

⁷¹ Infrastructure Act, div. F, tit. I, § 60102(h)(4)(A)(i).

⁷² See, e.g., *2021 Report*, 36 FCC Rcd at 843-44, para. 15.

⁷³ *Id.* at 844, para. 15. The data collected by the Ookla Speedtest mobile app include test results for download speed, upload speed, and latency, as well as other information, such as the location of the test and operating system of the handset. *Id.* at 852, para. 30 n.128.

⁷⁴ *Id.* at 843-44, para. 15. Ookla’s speed-test data provide a large set of observations of actual speeds that customers receive. *Id.* at 852, para. 30. In those areas with sufficient observations, these data are used to supplement the Commission’s Form 477 data, which provide service providers’ self-reported coverage polygons. *Id.* at 844, 852, paras. 15, 29. In the previous report, the Commission concluded that consumers were likely to be covered by 4G LTE services if there is at least one service provider serving that census block that reports 5/1 Mbps as the benchmark speed, based on their FCC Form 477 submission, using the centroid method. *Id.* at 852, para. 29. To

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31. The Commission is now collecting both mobile and fixed broadband availability data through the BDC, and has already collected three rounds of data (as of June 30, 2022, as of December 31, 2022, and as of June 30, 2023). The June 30, 2022, data were published on the National Broadband Map on November 18, 2022, and the public map was updated with December 31, 2022, data on May 30, 2023. Both datasets are available on the public map.⁷⁵ We therefore propose to use the two mobile datasets for this report. The BDC standardizes several of the mobile propagation map parameters that were not standardized in the FCC Form 477 data collection, such as minimum speeds for each technology (3G, 4G LTE, and 5G-NR) and parameter values for cell edge probability, cell loading, and spatial resolution.⁷⁶ We seek comment, for purposes of the next report, on whether we should continue to use the multiple speed metrics approach and whether we should also rely on Ookla data in addition to BDC data. If we also use on-the-ground speed test data as part of a multiple speed metrics approach, what on-the-ground speed metrics should we use for 5G-NR coverage? Should we continue to present 4G LTE availability data also?

32. We note that 5G-NR is the next-generation technology that several mobile providers are deploying and advertising to consumers.⁷⁷ As part of the BDC, the Commission is collecting 5G-NR coverage data using 35/3 Mbps and 7/1 Mbps minimum speed at the cell edge, including other standardized parameters.⁷⁸ In contrast, the FCC Form 477 data were not based on standardized speed metrics.⁷⁹ As a result, the 5G-NR coverage data submitted by carriers pursuant to FCC Form 477 varied substantially in the minimum advertised or expected speeds depicted. Although the Commission no longer collects deployment data through FCC Form 477, should we nonetheless consider using FCC Form 477 5G-NR data to assess deployment for historical context covering the time period before the BDC was implemented?

33. Should we adopt a speed benchmark to assess whether mobile services provide advanced telecommunications capability, and if so, what should that benchmark be? Should we consider using one

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identify counties with a median measured 4G LTE speed of at least 10/3 Mbps, the FCC Form 477 data were supplemented with Ookla data in counties that contained at least 300 Ookla test observations. *Id.* at 852-53, paras. 30. In December 2022, the Commission sunset the collection of broadband deployment data through the FCC Form 477, and we now collect broadband availability data through the BDC. *See 2022 Form 477 Order.*

⁷⁵ *Broadband Data Task Force Releases Pre-Production Draft of the National Broadband Map; Announces the Start of the Broadband Availability Challenge Processes*, WC Docket Nos. 11-10, 19-195, Public Notice, DA 22-1210 (WCB/WTB/OEA Nov. 18, 2022). *See* Chairwoman Rosenworcel Note, *National Broadband Map: It Keeps Getting Better*, <https://www.fcc.gov/national-broadband-map-it-keeps-getting-better> (May 30, 2023) (announcing release of new National Broadband Map which includes December 31, 2022 coverage data, results of challenges to the June 30, 2022 data, as well as other improvements to the data).

⁷⁶ *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Second Report and Order and Third Further Notice of Proposed Rulemaking, 35 FCC Rcd 7460, 7474-81, paras. 32-47 (2020) (*Second BDC Order*).

⁷⁷ *See, e.g.,* CTIA, *2022 Annual Survey Highlights* at 6 (Sept. 13, 2022), <https://www.ctia.org/news/2022-annual-survey-highlights> (“Today, 5G touches every facet of our lives, with 315 million Americans covered.”).

⁷⁸ 47 CFR § 1.7004(c)(3); *Second BDC Order*, 35 FCC Rcd at 7479-80, para. 45 (2020); *see also* *Inaugural Filing Window for Broadband Data Collection Has Opened; Filers May Begin Submitting Broadband Availability Data*, WC Docket Nos. 11-10, 19-195, Public Notice, 37 FCC Rcd 7656 (WCB/WTB/OEA 2022) (*Initial BDC Filing Window PN*). The Broadband Data Collection standardizes several of the mobile propagation map parameters that are not standardized in the FCC Form 477 data collection, such as minimum cell edge probabilities and cell loading factors, and maximum modeling resolution. *Second BDC Order*, 35 FCC Rcd at 7476-83, paras. 38-51.

⁷⁹ *See* FCC Form 477, *Local Telephone Competition and Broadband Report, Instructions for Filings as of December 31, 2019 – June 30, 2022* at 24 (2022), <https://us-fcc.app.box.com/v/Form477InstThruJune2022> (*June 2022 Form 477 Instructions*) (instructing mobile providers to submit polygons representing geographic coverage with the minimum advertised or expected speeds for a particular technology).

of the BDC availability speed thresholds (for example, a minimum speed of 35/3 Mbps) as a benchmark for determining whether advanced telecommunications capability is being deployed in a reasonable and timely fashion?⁸⁰ Are there other speed benchmarks the Commission should consider? Or should we refrain from adopting a standardized speed benchmark at this time? Should we consider only 5G-NR in determining whether mobile services provide advanced telecommunications capability or still continue to report 4G LTE?

34. If we establish a mobile benchmark, is it necessary for us to examine particular consumer use cases? We seek comment on the use cases for mobile services and on the minimum speeds they require. Should we identify both a minimum upload and a minimum download speed? If so, what speeds should we consider as sufficient to be considered “advanced telecommunications capability”?⁸¹ Next-generation applications, such as virtual and augmented reality, would benefit from a faster download throughput that corresponds to what the latest generation mobile networks should be capable of handling.⁸² Do these applications qualify as the “high-quality voice, data, graphics, and video telecommunications” contemplated by section 706?⁸³

35. *Service Quality.* In addition to upload and download speeds, other characteristics of mobile service quality include latency, jitter, and packet loss, especially while in motion. It may be correspondingly appropriate to analyze these metrics from report to report. As mobile networks transition to higher performance standards, such as those required by 5G-NR,⁸⁴ should the Commission analyze additional criteria for the section 706 report going forward, and, if so, should it consider benchmarks for those criteria that would affect a mobile network’s performance? For example, if data show certain levels of high latency, would that be evidence that a provider’s network is not providing “advanced telecommunications capability”? We seek comment generally regarding how to address additional potential criteria for the purposes of these reports and what data sources the Commission could rely on for analysis of additional metrics from year-to-year.

3. Number of Providers

36. As part of the next report, we propose to include an assessment of the number of fixed

⁸⁰ See *Establishing a 5G Fund for Rural America*, GN Docket No. 20-32, Report and Order, 35 FCC Rcd 12174, 12206, para. 78 (2020) (requiring support recipients to deploy 5G-NR service with median speeds of at least 35/3 Mbps). *Uniendo a Puerto Rico Fund and the Connect USVI Fund; Connect America Fund; ETC Annual Reports and Certifications*, WC Docket Nos. 18-143, 10-90, and 14-58, Report and Order on Reconsideration, 34 FCC Rcd 9109, 9163, para. 102 (2019) (requiring 5G-NR deployments to be capable of at least 35/3 Mbps).

⁸¹ Live stream of a 1080p video at 30 frames per second is achievable with a 3 Mbps upload speed. 4K live streams can require up to between 8 Mbps and 51 Mbps upload depending on, among other things, frame rate. Boxcast, *Upload Speeds for 4K Live Streaming* (Dec. 20, 2022), <https://www.boxcast.com/blog/internet-speeds-for-4k-live-streaming>; YouTube Help, Choose Live Encoder Settings, Bitrates, and Resolutions, <https://support.google.com/youtube/answer/2853702?hl=en#zippy=%2Cp-fps%2Cp%2Ck-p-fps> (*YouTube Recommended Live Encoder Settings*) (last visited Oct. 23, 2023). Bandwidth recommendations for live streaming tend to be higher than for merely watching video of the same quality to ensure consistent throughput at the necessary speed. See Restream, *What is a good upload speed for streaming?* (July 1, 2022), <https://restream.io/blog/what-is-a-good-upload-speed-for-streaming/>. Compare, e.g., *YouTube Recommended Live Encoder Settings with YouTube Video Bandwidth Recommendations*.

⁸² See, e.g., Qualcomm Technologies, *VR and AR Pushing Connectivity Limits at 10, 14-18* (2018), <https://www.qualcomm.com/media/documents/files/vr-and-ar-pushing-connectivity-limits.pdf>.

⁸³ 47 U.S.C. § 1302(d)(1).

⁸⁴ See, e.g., 3GPP, *Technical Specification Group Services and System Aspects; Release 15 Description, Technical Report 21.915 v.15.0.0 at 10* (2019), https://www.etsi.org/deliver/etsi_tr/121900_121999/121915/15.00.00_60/tr_121915v150000p.pdf (discussing Ultra Reliable and Low Latency Communications support).

and mobile broadband provider options to which consumers have access. Such data may help us understand barriers to deployment because the number of providers may correlate, at least to some degree, with such barriers. Further, where there are provider options for broadband service, there may also tend to be more competitive pricing and better quality of service.⁸⁵ We seek comment on this proposal. Do commenters agree that examining the number of providers available to consumers would have these benefits? Are there any other benefits?⁸⁶ Are there any conclusions that we should be drawing based on this information? If so, what evidence must we find in order to draw any such conclusions? Should we assess the number of broadband providers on an individual location basis (if data are available), census block basis, or a more aggregated level such as census block group? The latter would enable us to look at how demographic data may differ across areas by the number of providers.

B. Relationship Between Fixed and Mobile Broadband Service

37. In considering the extent of substitutability between fixed and mobile services, the Commission has recognized that consumers have distinct broadband uses in the home and on the go.⁸⁷ For instance, a fixed service is typically needed to connect all of the smart devices in the home with sufficient bandwidth to enable all those devices' use at the same time. In contrast, while consumers may also access the Internet on a mobile device in their homes, a mobile service is necessary for Internet access when consumers are on the go.⁸⁸ These services are often marketed as complementary,⁸⁹ and the Commission has previously cited evidence that consumers who have the means to subscribe to both mobile and fixed services are likely to subscribe to both.⁹⁰ This suggests that mobile and fixed broadband services may not be substitutes for all consumers' needs.⁹¹ Many households continue to subscribe to both fixed and mobile broadband service, suggesting that these separate services offer benefits that households may view as complementary or independent of each other.⁹² We seek comment, for the purposes of the next report, on whether to continue not treating fixed and mobile services as full substitutes.

38. Does deployment of advanced telecommunications capability require access to both fixed and mobile broadband services? We also seek comment on the degree of substitutability between mobile and fixed services and how that has changed over time. What data exist concerning the cross-elasticity of demand between the services?⁹³ How do the plan characteristics of typical fixed and mobile broadband

⁸⁵ See, e.g., Jonathan Sallet, Benton Institute for Broadband & Society, *Broadband for America's Future: A Vision for the 2020s* at 49-51 (2019) https://www.benton.org/sites/default/files/BBA_full_F5_10.30.pdf (*Benton Foundation 2019*) (citing multiple studies).

⁸⁶ We seek comment below in Section IV.A.1.a. on the extent to which the apparent number of providers in a particular geographic location may or may not serve as useful information regarding the validity of the underlying deployment data.

⁸⁷ *2021 Report*, 36 FCC Rcd at 840-41, para. 10.

⁸⁸ *Id.* at 840, para. 10.

⁸⁹ See, e.g., AT&T, *Let's get you connected*, <https://www.att.com/> (showing the ability to subscribe to fixed and mobile broadband, respectively, on the same website) (last visited Oct. 23, 2023); Verizon, *Mix and match Fios Internet and TV*, <https://www.verizon.com/home/bundles/fios/> (offering discounts when subscribing to both mobile service and home Internet service) (last visited Oct. 23, 2023).

⁹⁰ *2021 Report*, 36 FCC Rcd at 840, para. 10.

⁹¹ See *id.*

⁹² *Communications Marketplace Report*, GN Docket No. 22-203, 2022 Communications Marketplace Report, FCC 22-103, 116, para. 158 (Dec. 30, 2022).

⁹³ By cross-elasticity of demand, we mean the extent to which demand for one service is affected by a change in price of another service.

service plans compare—for example, in terms of price, data allowances, throttling policies, overage fees, etc.?

39. For the purpose of evaluating access to advanced telecommunications capability, we propose that the next section 706 report should present the following categories as part of the Commission's section 706 deployment evaluation: (1) the percentage of Americans with access to fixed services meeting our benchmarks; (2) the percentage of Americans with access to mobile services meeting certain stated characteristics (whether these characteristics constitute a benchmark or otherwise); and (3) the percentage of Americans with access to *both* fixed broadband service meeting our benchmarks and mobile services meeting certain stated characteristics (whether these characteristics constitute a benchmark or otherwise). We seek comment on this proposal.

IV. EVALUATING SECTION 706'S UNIVERSAL SERVICE GOALS FOR BROADBAND

40. In this section we seek comment regarding each of our proposed universal service goals for broadband—deployment, affordability, adoption, availability, and equitable access. We seek comment on how to define these goals, how these goals can be evaluated, and what data is available to assess each goal.

A. Deployment

41. We propose to evaluate whether broadband has been universally deployed by evaluating the physical deployment of broadband networks that are capable of providing service at what we select as our speed benchmark(s) for advanced telecommunications capability. We seek comment on this proposal. Are there alternative ways for the Commission to evaluate the universal service broadband goal of deployment? For instance, is there available data on the number of additional miles of fiber built, new tower construction, or new spectrum licenses that would assist us in our inquiry?

1. Physical Deployment Data

42. We propose to use the broadband availability data collected by the BDC to evaluate physical deployment in the next Report and seek comment on this proposal. This will be the first section 706 inquiry in which BDC data are available to the Commission. Since 2016, the Commission relied exclusively on FCC Form 477 data to conduct this evaluation.⁹⁴ The BDC data are substantially improved from the FCC Form 477 data due to more precise location-specific data from fixed broadband service providers and the application of more uniform standards to mobile broadband providers.⁹⁵ Further, unlike the FCC Form 477 data, BDC data are subject to a more stringent BDC verification

⁹⁴ 2021 Report, 36 FCC Rcd at 847-48, para. 21-22; *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 19-285, 2020 Broadband Deployment Report, 35 FCC Rcd 8986, 8997-98, para. 24 (2020) (2020 Report); *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 18-238, 2019 Broadband Deployment Report, 34 FCC Rcd 3857, 3868, para. 24 (2019 Report); 2018 Report, 33 FCC Rcd at 1677, para. 43; 2016 Report, 31 FCC Rcd at 729, para. 73; *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*, GN Docket No. 14-126, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, 1414, para. 68 (2015) (using other data for references to prior years). It relied exclusively on such data for mobile service in 2016 and began supplementing FCC Form 477 data with Ookla data in 2018 (there was no 2017 report). 2021 Report, 36 FCC Rcd at 844, para. 15; 2020 Report, 35 FCC Rcd at 9001-02, para. 33; 2019 Report, 34 FCC Rcd at 3871, para. 30; 2018 Report, 33 FCC Rcd at 1677, para. 43; 2016 Report, 31 FCC Rcd at 729, para. 73. Service providers did not begin filing BDC data until last year. See *Initial BDC Filing Window PN*.

⁹⁵ 2022 Form 477 Order, FCC 22-93, at 5-6, para. 12.

process and also iterative challenge processes required by Congress.⁹⁶ These considerations led the Commission to sunset the collection of FCC Form 477 broadband deployment data in December 2022, making the deployment data submitted as of June 30, 2022, the last vintage.⁹⁷

43. Do commenters agree that the Broadband DATA Act requires us to use the National Broadband Map “to determine the areas in which . . . broadband internet access service is and is not available; and . . . when making any new award of funding with respect to the deployment of broadband internet access service intended for use by residential and mobile customers”⁹⁸ as our primary source in this section 706 inquiry? Are there any special considerations regarding the iterative BDC process that we should take into account when using BDC data? For example, the initial National Broadband Map published on November 18, 2022 was a pre-production draft based on the inaugural BDC collection of data as of June 2022, and the subsequent release on May 30, 2023, based on December 31, 2022, data, incorporated the results of challenges to the locations identified in the June 2022 Broadband Serviceable Location Fabric and those challenges to availability data which had been resolved as of that time. That map contained significant updates and improvements to the data.⁹⁹ Should we only rely on BDC data released on or after May 30, 2022? Further, can BDC data or any other sufficiently reliable data be used to inform any conclusions we may make on the broadband needs specific to small businesses, particularly data at a geographically disaggregated level?¹⁰⁰ We remind commenters, however, that we do not intend to use this Inquiry to entertain any proposals to make changes to the BDC, FCC Form 477 (with respect to subscribership and voice availability information), or any other Commission data collection.¹⁰¹

44. Section 706 requires the Commission to compile a list of geographic areas lacking access to advanced telecommunications capability in its report.¹⁰² We are further required to provide population, population density, and average per capita income for each of these unserved areas.¹⁰³ Income, however, is only one demographic category—other categories may also be significant. In addition to fulfilling the minimum requirements of section 706, are geographically disaggregated data sources available that would enable the Commission also to provide additional demographic information regarding both deployment and adoption of advanced telecommunications capability, for example, considering the unserved population by race, ethnicity, age, or disability status?

a. Fixed deployment data

45. We propose to use BDC data for measuring physical deployment of fixed broadband services for the next section 706 report, including fixed terrestrial, fixed wireless, and fixed satellite service. The BDC remedies one of the primary shortfalls of the FCC Form 477 by requiring reporting of

⁹⁶ See 47 U.S.C. § 642(b)(5); 47 CFR § 1.7006; *Second BDC Order*, 35 FCC Rcd at 7484-91, paras. 56-76; *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Third Report and Order, 36 FCC Rcd 1126, 1146-74, paras. 47-124.

⁹⁷ *2022 Form 477 Order*, FCC 22-93, 5-6, para. 13.

⁹⁸ Broadband Deployment Accuracy and Technology Availability Act, Pub. L. No. 116-130, 134 Stat. 228, 236 (2020) (codified at 47 U.S.C. § 642(c)(2)).

⁹⁹ See Chairwoman Rosenworcel Note, *National Broadband Map: It Keeps Getting Better*, <https://www.fcc.gov/national-broadband-map-it-keeps-getting-better> (May 30, 2023).

¹⁰⁰ See *GAO Small Business Report*.

¹⁰¹ Comments regarding the Broadband Data Collection, our implementation of the Broadband DATA Act, and FCC Form 477 should be filed in either or both WC Docket No. 19-195 (*Establishing the Digital Opportunity Data Collection*) and WC Docket No. 11-10 (*Modernizing the FCC Form 477 Data Program*).

¹⁰² 47 U.S.C. § 1302(c). In the past, the Commission has provided this list in an appendix providing county-by-county statistics. See, e.g., *2021 Report*, 36 FCC Rcd at 910-1008 (Appendix D).

¹⁰³ *Id.*

deployment on a more granular basis. The FCC Form 477 required facilities-based providers of fixed broadband service to report the census blocks in which they provide broadband service to end-user customers.¹⁰⁴ These FCC Form 477 data did not, however, reveal the number of discrete locations within a census block to which a provider makes fixed broadband service available.¹⁰⁵ As a result, as the Commission has recognized since 2015, coverage analyses based on FCC Form 477 likely overstated the broadband coverage experienced by some consumers, especially in large or irregularly-shaped census blocks. The BDC, in contrast, requires terrestrial fixed and satellite broadband providers to submit polygon shapefiles or a list of locations at which they make service available,¹⁰⁶ which we believe is particularly useful when attempting to measure whether deployment is truly universal. Further, as discussed above, BDC data submissions are subject to challenge and verification processes, as well as audits. We seek comment on our proposal. Even if we primarily base our analysis on BDC data, is there a means by which historical FCC Form 477 deployment data should inform our analysis?

46. The Broadband DATA Act requires us to use the BDC map(s) “to determine the areas in which . . . broadband internet access service is and is not available; and . . . when making any new award of funding with respect to the deployment of broadband internet access service intended for use by residential and mobile customers.” We seek comment on whether there are additional data that we should use to supplement the BDC data, such as BroadbandNow’s quarterly reports.¹⁰⁷ Do other sources measure speeds that would be relevant to our analysis? Are those sources sufficiently comprehensive geographically? Should we use data from NTIA, the U.S. Department of Agriculture (USDA), the Treasury Department, or other federal, state, or local sources in conjunction with BDC data to assess the state of fixed deployment?¹⁰⁸ We also seek comment on how to ensure that fixed broadband deployment data received outside of the BDC process are reliable. To the extent that a commenter proposes that we use additional data sources as supplements to the BDC data, we request that commenters describe the precise manner in which this should be done. For example, where there is a contradiction between the datasets, which data should take precedence?

b. Mobile deployment data

47. We seek comment on the appropriate mobile broadband deployment data that we should use for the next section 706 report. We propose to use mobile broadband deployment data collected through the BDC. As noted above, these data are based on standardized parameters for speed, cell edge probability, cell loading, and spatial resolution. In addition to data collected through the BDC, should we also use FCC Form 477 mobile broadband deployment data for historical context? Would a comparison of FCC Form 477 mobile broadband deployment data with the data collected through the BDC provide useful information with which to assess changes in the deployment of mobile broadband services over the past several years? Are there other data sources that would be appropriate for the Commission to use?

¹⁰⁴ *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887, 9902, para. 32 (2013); *June 2022 Form 477 Instructions* at 17-18 (requiring a fixed service provider to report census blocks in which it “does, or could, within a service interval that is typical for that type of connection,” provide access to broadband connections to end-user premises).

¹⁰⁵ *2022 Form 477 Order*, FCC 22-93, 1, para. 2.

¹⁰⁶ 47 CFR § 1.7004(c)(1). Specifically, a service provider must report where it “has actually built out its broadband network infrastructure, such that the provider is able to provide service, and where the provider is capable of performing a standard broadband installation.” *Id.*

¹⁰⁷ See BroadbandNow Research, *BroadbandNow Research*, <https://broadbandnow.com/research> (last visited Oct. 23, 2023).

¹⁰⁸ The Commission’s Broadband Funding map provides data regarding funding from broadband programs administered by the Commission, NTIA, the USDA’s Rural Utilities Service, and the Treasury Department. Federal Communications Commission, Broadband Funding Map, <https://fundingmap.fcc.gov/home> (last visited Oct. 23, 2023).

Should we use data from NTIA, USDA, the Treasury Department, or other federal, state, or local sources in conjunction with BDC data to assess the state of mobile deployment?

48. Should we use Ookla on-the-ground speed test data to supplement BDC data or are other data sources available? In the previous report, the Commission supplemented provider-reported FCC Form 477 data with Ookla speed-test data in those areas where providers claimed to provide 4G LTE with a minimum 5/1 Mbps advertised speed to identify areas showing median speed tests of at least 10/3 Mbps. The analysis of the availability of mobile 4G LTE services with a median speed of 10/3 Mbps was performed in counties with at least 300 test observations in a given timeframe, and the results were assigned to each census block within the county.¹⁰⁹ If we use the Ookla data in conjunction with mobile broadband deployment data we have collected in the BDC, are there any changes we should make to the methodology we currently use to determine deployment? We seek comment generally regarding use of on-the-ground testing for the Commission's understanding of mobile broadband speeds and whether to continue to use these tests for 4G LTE and 5G-NR data. What are the advantages and disadvantages of using Ookla or any other alternative forms of on-the-ground testing data?

2. Criteria and Standards for School and Classroom Broadband Access

49. Section 706 requires the Commission to focus on the deployment and availability of advanced telecommunications capability to “elementary and secondary schools and classrooms.”¹¹⁰ During the course of the global COVID-19 pandemic, access to broadband became even more critical in ensuring that American schoolchildren do not fall behind. Especially during the first year of the pandemic, many students were forced to stay at home, which further exposed the gaps in connectivity as some students lacking access to fixed broadband service were prevented from keeping pace with students who have access to such service.¹¹¹ Accordingly, teachers and administrators were forced to take extraordinary measures—including purchasing cellular data for students with phones or tablets, and setting up hotspots and outdoor work areas on school grounds so students can download lesson materials and upload homework assignments—to ensure that students were able to participate in remote instruction.¹¹² Even though in-person schooling has resumed, many students still lack connections at home, making it difficult to complete homework. It is imperative that schools have the speed and bandwidth required to adequately educate America's children both in schools and at home.

50. Since 2015, the Commission has used two speed benchmarks to measure deployment for schools: (1) a short-term speed benchmark of 100 Mbps per 1,000 students and staff, and (2) a long-term speed benchmark of 1 Gbps per 1,000 students and staff.¹¹³ We note that according to the *2019 State of*

¹⁰⁹ *2021 Report*, 36 FCC Rcd at 853, paras. 29-30 & n.130.

¹¹⁰ 47 U.S.C. § 1302(b).

¹¹¹ See Monica Chin, *America's Internet Wasn't Prepared For Online School: Distance learning shows how badly rural America needs broadband*, The Verge (Oct. 7, 2020), <https://www.theverge.com/21504476/online-school-covid-pandemic-rural-low-income-internet-broadband>; *What COVID-19 Underscores About How Broadband Connectivity Affects Educational Attainment: Johannes Bauer of the Quello Center for Media & Information Policy discusses what leaders can do to prepare for long-term remote learning*, The Pew Charitable Trusts (Dec. 7, 2020), <https://www.pewtrusts.org/en/research-and-analysis/articles/2020/12/08/what-covid-19-underscores-about-how-broadband-connectivity-affects-educational-attainment>.

¹¹² See Alice Opalka et al., *Rural school districts can be creative in solving the internet connectivity gap--but they need support*, Brookings (Aug. 10, 2020), <https://www.brookings.edu/blog/brown-center-chalkboard/2020/08/10/rural-school-districts-can-be-creative-in-solving-the-internet-connectivity-gap-but-they-need-support/> (noting that, in order to help students participate in remote instruction, some rural school districts have been forced to map locations in the community that offer free Internet access, purchase cellular data for students who have phones or tablets, connect families with companies that offer free or low-cost Internet, and set up hotspots and outdoor work areas on school grounds so students can download materials and upload assignments).

¹¹³ See *2015 Report*, 30 FCC Rcd at 1410, para. 62.

the States Report, 99% of school districts have met the 100 Mbps goal.¹¹⁴ In light of the available data and the increased demand for one-to-one device use necessitated by the COVID-19 pandemic,¹¹⁵ we seek comment on whether we should increase either or both of the short and long term goals.¹¹⁶ Specifically, we propose raising the short-term speed benchmark to 1 Gbps per 1,000 students and staff, which would necessitate also raising the long-term goal. If we increase either goal, are there adequate data sources to use in our assessment? If so, what are they? Should we consider student access to advanced telecommunications capability outside of school, and if so, how?

51. What data should we use to evaluate the extent of broadband deployment to America's elementary and secondary schools? Should we use data from the next iteration of Connected Nation's Connect K-12 Report?¹¹⁷ We also seek comment on any alternative data sources available for us to evaluate broadband deployment in America's schools as required by section 706 prior to the statutory deadline for our inquiry. For example, if the CoSN publishes an updated version of its Annual Infrastructure Survey Report, should we use those data?¹¹⁸ Are there any independent studies that could be helpful in analyzing broadband deployment to schools? Should we try to evaluate student access to broadband outside of schools?

3. Tribal Lands

52. Today, too many people living on Tribal lands lack access to adequate broadband. In 2020, the President of the Navajo Nation testified to Congress that over half of Navajo chapters lack *any* broadband access at all, let alone access that meets our current definition of advanced telecommunications capability.¹¹⁹ For us to measure not only how far is left to go in deploying broadband on Tribal lands, but also how such deployment stacks up against that on non-Tribal lands, the Commission must first accurately measure such deployment. We propose to use the same standards for analyzing fixed and

¹¹⁴ See EducationSuperHighway, 2019 State of the States Report, at 7-8 (2019), <https://s3-us-west-1.amazonaws.com/esh-sots-pdfs/2019%20State%20of%20the%20States.pdf> (2019 *State of the States Report*). EducationSuperHighway reports the Commission's short-term goal in terms of 100 kbps per user, rather than 100 Mbps per 1,000 users, and reports the long-term goal in terms of 1 Mbps per user, rather than 1 Gbps per 1,000 users. See *id.* at 7, 13; *Modernizing the E-rate Program for Schools and Libraries*, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870, 8885, para. 34 (2014) (2014 *First E-rate Order*).

¹¹⁵ Alyson Klein, *During COVID-19, Schools Have Made a Mad Dash to 1-to-1 Computing. What Happens Next?* (Apr. 20, 2021), <https://www.edweek.org/technology/during-covid-19-schools-have-made-a-mad-dash-to-1-to-1-computing-what-happens-next/2021/04>.

¹¹⁶ According to the 2022 *Connect K-12 Report*, the most recent comprehensive data available, 67% of school districts currently meet the long-term goal. See Connected Nation, Report on School Connectivity for Funding Year 2022 at 3 (2022) (2022 *Connect K-12 Report*), <https://learns.ade.arkansas.gov/File/qs5agsnu.pdf>. The Connect K-12 Report is the successor to the EducationSuperHighway's State of the States Report. See Connected Nation, Report on School Connectivity for Funding Year 2021 at 14 (2022), https://www.fundsforlearning.com/wp-content/uploads/2022/01/Connect_K12_Connectivity_Report_2021.pdf; 2021 *Report*, 35 FCC Rcd at 853-54, para. 31).

¹¹⁷ The *Connect K-12 Report* tracks and provides analyses of public school progress toward the Commission's long-term goal for K-12 school connectivity based on 2022 application data from the Commission's E-rate program. 2022 *Connect K-12 Report* at 13. It includes data from 12,911 public school districts that serve 44.9 million students across all 50 states. *Id.*

¹¹⁸ At present, the most recent CoSN Annual Infrastructure Report is the 2018-19 report, which does not include data for 2019. See 2021 *Report*, 36 FCC Rcd at 853 n.134.

¹¹⁹ Testimony of Jonathan Nez, President of the Navajo Nation, Before the United States House of Representatives Committee on Energy and Commerce Full Committee Hearing on "Addressing the Urgent Needs of Our Tribal Communities," July 8, 2020, <https://docs.house.gov/meetings/IF/IF00/20200708/110874/HHRG-116-IF00-Wstate-NezJ-20200708.pdf>.

mobile broadband deployment on Tribal lands as we do for all areas and present the same data, to whatever extent such data are available. Do commenters agree with this proposed approach? Are there any special factors that should guide our analysis of deployment and access on Tribal lands?

53. How should we measure broadband deployment on Tribal lands? Are the considerations regarding the Commission's deployment data for Tribal lands any different than for non-Tribal lands? For example, are there alternative sources of data concerning broadband deployment on Tribal lands? If so, how should we incorporate the data from such sources into our analyses of broadband deployment on Tribal lands? Further, we invite parties to comment on our manner of presenting data regarding Tribal lands and whether a different or more extensive method of disaggregation would be useful and practical.¹²⁰

B. Affordability

54. It is more apparent than ever before that broadband is a necessity for all Americans. Yet far too many households across the country wrestle with how to pay for gas and groceries and also keep up with the broadband bill, and the lack of access to and adoption of home broadband has amplified and reinforced existing inequities in our society. To truly close the connectivity gap and ensure that all Americans have access to advanced telecommunications capability, broadband services must be affordable. A Pew Research Center survey conducted in 2021 indicated that adults with household incomes of \$30,000-\$49,999 per year were nine times more likely to not have Internet service than those with incomes of \$75,000 or more per year, and those with incomes less than \$30,000 per year were 14 times more likely not to have Internet service.¹²¹ A 2022 Brookings Institution survey study found that in rural areas, 54.7% of people with an annual income of less than \$10,000 subscribed to high-speed broadband at home, but 74.9% of people with an annual income of \$100,000 to \$149,000 subscribed to high-speed broadband at home.¹²² Many studies have reported that cost is a primary obstacle for non-adopters.¹²³ The COVID-19 pandemic highlighted the importance of obtaining affordable broadband.

¹²⁰ See 2021 Report, 36 FCC Rcd at 846, n.84.

¹²¹ Pew Research Center, *Internet/Broadband Fact Sheet* at 2 (Apr. 7, 2021), <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>. Further, a University of Kansas study conducted between January 2021 and January 2022 found that cost is the top reason that respondents living in cities do not have broadband access at home. Donna Ginther et al., University of Kansas, *Broadband in Kansas: The Challenges of Digital Access and Affordability* at 24 (2023), <https://ipsr.ku.edu/broadband/BroadbandinKansas.pdf>.

¹²² Nicol Lee et al., *Why the federal government needs to step up efforts to close the rural broadband divide*, Brookings (Oct. 4, 2022), <https://www.brookings.edu/research/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/>.

¹²³ See, e.g., National Telecommunications and Information Administration, *New Analysis Shows Offline Households are Willing to Pay \$10-a-Month on Average for Home Internet Service, Though Three in Four Say Any Cost is Too Much* (Oct. 6, 2022), (survey finding three in four offline households reported that paying any cost for internet would be too much); EveryoneOn, *Affordability and the Digital Divide* (Dec. 2021), <https://static1.squarespace.com/static/5aa8af1fc3c16a54bcb0415/t/61ad7722de56262d89e76c94/1638758180025> (*EveryoneOn 2021*) (survey finding that 40% of households making \$50,000 or less report being unable to pay anything for high-speed internet and 22% of them report being able to pay only \$25/month for it); Andrew Perrin, *Mobile Technology and Home Broadband 2021*, Pew Research Center (June 3, 2021), <https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/> (finding that 45% of non-adopters “do not subscribe to high-speed internet at home . . . [because] the monthly cost of a subscription is too expensive”); Becky Chao & Claire Park, *The Cost of Connectivity 2020* at 10 (2020), https://d1y8sb8igg2f8e.cloudfront.net/documents/The_Cost_of_Connectivity_2020_XatkXnf.pdf; Benton Foundation 2019 at 65-66 (discussing multiple studies); Rafi Goldberg, National Telecommunications and Information Administration, *Unplugged: NTIA Survey Finds Some Americans Still Avoid Home Internet Use*, <https://www.ntia.doc.gov/blog/2019/unplugged-ntia-survey-finds-some-americans-still-avoid-home-internet-use> (with respect to families with incomes of less than \$25,000/year) (last visited Oct. 23, 2023); John B. Horrigan &

(continued....)

For instance, according to an EveryoneOn survey taken during the COVID-19 pandemic, 18% of households making \$50,000 or less lost broadband connectivity and 49% were on the brink of doing so due to an inability to pay.¹²⁴ The need for affordable broadband during the pandemic became so acute that Congress, as part of the Consolidated Appropriations Act, 2021, established the \$3.2 billion Emergency Broadband Connectivity Fund, under which eligible low-income households could receive a discount off the cost of broadband service and certain connected devices during an emergency period relating to the COVID-19 pandemic, and participating providers can receive a reimbursement for such discounts.¹²⁵ In recognition of the continued broadband affordability issue facing the nation, Congress, in the Infrastructure Act,¹²⁶ appropriated an additional \$14.2 billion for the Affordable Connectivity Program, which changes the monthly support amount but maintains a monthly discount and the one-time connected device reimbursement.¹²⁷ As of October 23, 2023, over 21 million households currently benefit from the Affordable Connectivity Program.¹²⁸ We seek comment on how we should measure affordability as part of our section 706 inquiry. Can low adoption rates for particular services indicate that the service is perceived as not affordable rather than merely demonstrating the revealed preferences of consumers given their overall service requirements and budget constraints? What other factors may lead to differential subscription rates for higher speed services between higher income and lower income areas? We also seek comment on the extent to which the answers to these questions depend on the technology deployed, such as mobile, fixed terrestrial, fixed wireless, or fixed satellite.

55. If we were to look beyond subscriber patterns in examining affordability, should we examine prices for broadband services and compare them against a selected benchmark to determine affordability? Are there other methods of measuring affordability? If we were to compare price to a benchmark, are there adequate sources to enable us to adopt a benchmark? To what would we compare the price information that we collect? Could we use as a benchmark a percentage of a certain level of income? How would we take into account the fact that a single household might have multiple mobile accounts (either individually or grouped into a family plan) while it would likely only have a single fixed

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Maeve Duggan, Pew Research Center, Home Broadband 2015 at 15-18 (2015), <https://www.pewresearch.org/wp-content/uploads/sites/9/2015/12/Broadband-adoption-full.pdf>.

¹²⁴ *EveryoneOn 2021*. See also Colleen McClain et al., Pew Research Center, *90% of Americans say the internet has been essential or important to them, many made video calls and 40% used technology in new ways. But while tech was a lifeline for some, others faced struggles* (Sept. 1, 2021), <https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/> (survey finding that more than half of lower-income broadband users said they worried a lot or some about being able to pay for high-speed internet). For a description of the methodology used to determine lower income, see Pew Research Center, *53% of Americans Say the Internet Has Been Essential During the COVID-19 Outbreak*, (Apr. 30, 2020), at n.1, <https://www.pewresearch.org/internet/2020/04/30/53-of-americans-say-the-internet-has-been-essential-during-the-covid-19-outbreak/>.

¹²⁵ Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, 134 Stat. 1182, 2130, 2135, div. N, tit. IX, div. N, tit. V, § 904(i) (2020)); *Emergency Broadband Benefit Program*, WC Docket No. 20-445, Report and Order, 36 FCC Rcd 4612 (2021).

¹²⁶ Infrastructure Act, div. F, title V, § 60502(a); div. J, title IV.

¹²⁷ The Affordable Connectivity Program (ACP) launched on December 31, 2021, and the Emergency Broadband Benefit Program ceased accepting new enrollments on December 30, 2021. *Emergency Broadband Benefit Program*, WC Docket Nos. 20-445, 21-450, Order, 36 FCC Rcd 16484 (WCB 2021); Press Release, FCC, FCC Launches Affordable Connectivity Program, (Dec. 31, 2021), <https://docs.fcc.gov/public/attachments/DOC-378908A1.pdf>. The Commission adopted final ACP rules in January 2022. *Affordable Connectivity Program, Emergency Broadband Benefit Program*, WC Docket Nos. 21-450, 20-445, Report and Order and Further Notice of Proposed Rulemaking, 37 FCC Rcd 484 (2022).

¹²⁸ Universal Service Administrative Service Company, *ACP Enrollment and Claims Tracker* (Oct. 23, 2023), <https://www.usac.org/about/affordable-connectivity-program/ACP-enrollment-and-claims-tracker/#total-enrolled>.

broadband account? Should a household be able to afford mobile and fixed broadband service simultaneously in order for advanced telecommunications capability to be available to them? Should an affordability determination change depending on the area of the country we are evaluating? We also seek comment on how we should account for federal and state programs that provide broadband consumer subsidies, such as the Lifeline program, the Emergency Broadband Benefit Program, and the Affordable Connectivity Program.¹²⁹

56. If we were to conduct an analysis of the affordability of broadband service, what data should we use to measure the affordability of service? How should we analyze such data? For example, is the adoption rate a sufficient proxy, at least for services for which we are able to calculate valid adoption rates? Is there a way for us to conduct such an analysis while accounting for the factors that drive consumer decisions concerning what kind of broadband service to purchase? The Commission has previously provided some demographic analysis of adoption based upon FCC Form 477 subscriber data.¹³⁰ Is this analysis helpful for the purposes of analyzing affordability?¹³¹ Would there be a useful way to apply demographic information to adoption data to draw any inferences? Are adequate data available to do this? Is there a particular analysis that we should conduct using such methods? What other types of information might be relevant, such as studies on the sensitivity of demand to changes in price and consumer income?

57. If we were to use pricing data to determine affordability, are there adequate sources available sufficient to comprehensively document price variation between plans and across geographic locations? Do these sources measure pricing in a manner that is relevant to the consumer experience? For example, to what extent do they take into account equipment rental, promotions and discounts (such as family plans and commonly subscribed to bundles), early termination fees for contracts, other recurring fees, and nonrecurring charges (such as installation)? Should the data we rely on include such factors? How should we account for the price of pre-paid mobile plans? To what extent should fixed and mobile data allowances and overage charges affect our analysis?

C. Adoption

58. We propose to examine the universal service goal of adoption by examining the rate at which people who have a service available to them actually subscribe to the service. We seek comment on this proposal and whether there are alternative ways to conceive of adoption. Adoption rates can be heavily influenced by, among other things, how affordable the service is. The Commission has previously measured fixed broadband adoption by dividing the number of subscribed fixed connections at

¹²⁹ See, e.g., FCC, *Lifeline Support for Affordable Communications*, <https://www.fcc.gov/lifeline-consumers#:~:text=Lifeline%20is%20the%20FCC's%20program,participating%20wireline%20or%20wireless%20providers> (last visited Oct. 23, 2023); Cal. Pub. Util. Comm'n, Order Instituting Rulemaking Regarding Revisions to the California Universal Telephone Service (LifeLine) Program, Rulemaking 11-03-013, Decision Adopting Revisions to Modernize and Expand the California Lifeline Program, Decision 14-01-036 (2014), <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M086/K541/86541587.PDF>; Kan. Stat. Ann. § 66-2006 (2020); Kentucky Pub. Serv. Comm'n, An Inquiry Into the State Universal Service Fund, Case No. 2016-00059, Order (2020), https://psc.ky.gov/pscscf/2016%20Cases/2016-00059//20200710_PSC_ORDER.pdf.

¹³⁰ See, e.g., *2021 Report*, 36 FCC Rcd at 867, para. 47.

¹³¹ The FCC Form 477 subscriber data is collected at the census tract level and does not include demographic information about the subscriber. While demographic data can be considered with subscriber patterns for Internet services at a more granular level with the American Community Survey data, that data is of limited use because there is no speed associated with the household. Furthermore, the most granular data that would be unaffected by the difficulties of collecting household level data are the 2015-2019 ACS 5-Year estimates. See e.g., Census Bureau Releases Experimental 2020 American Community Survey 1-Year Data, <https://www.census.gov/newsroom/press-releases/2021/experimental-2020-acs-1-year-data.html>.

the pertinent speed by the total number of households in the area with access to such service.¹³² Thus, calculating adoption requires not only having deployment data, but also subscriber data.

59. We collect fixed subscribership information as part of the FCC Form 477 data collection, which can be used in conjunction with deployment data to estimate the adoption rates for the census tract and less granular areas such as the county and the state.¹³³ While this subscribership collection is now made through the BDC filing platform, it remains FCC Form 477 data.¹³⁴ We have also presented an adoption analysis for Tribal Lands and “urban core” versus non-urban core areas.¹³⁵ Should we use FCC Form 477 data to measure adoption rates for fixed broadband service? Are there any weaknesses to these data? If so, what are they? Should we present fixed broadband adoption data only generally, or also on a technology-specific basis, such as with separate data for fixed terrestrial, fixed wireless, and fixed satellite?

60. Should we use FCC Form 477 data to also measure mobile broadband subscribership, that is, handset count data? We note that such data are only collected at the state level, as opposed to the fixed subscribership data, which are collected at the more granular census tract level,¹³⁶ which prevents us from disaggregating mobile subscribership between urban and rural areas. How should we take this into account? While providers report the number of consumer connections for mobile broadband (defined as a connection not billed to a corporate, non-corporate business, government, or institutional customer account), we are unable to determine the percentage of our mobile subscriber data that are part of a single account (for example, a family plan). Are any potential weaknesses in the FCC Form 477 subscribership data sufficient reasons for not using such data in any particular way?

61. Are there potential sources of data other than the FCC Form 477 subscribership data that can be used to measure adoption? For example, would data from the National Telecommunications and Information Administration’s Current Population Survey Supplement for Computer and Internet Usage, the Census Bureau’s American Community Survey, BroadbandNow, or the Pew Research Center be useful? We note that each of these data sources uses sampling methods to estimate the percentage of the total population within an area that subscribes to broadband.¹³⁷ Could these data be used to estimate total

¹³² See, e.g., *2021 Report*, 36 FCC Rcd at 865, para. 45; *2020 Report*, 35 FCC Rcd at 9015, para. 49; *2019 Report*, 34 FCC Rcd at 3884, para. 47.

¹³³ FCC Form 477, Local Telephone Competition and Broadband Report, Instructions for Filings as of December 31, 2022 and Beyond at 14-15, 21, <https://us-fcc.box.com/v/Form477Instructions> (last visited Oct. 23, 2023). See also, e.g., *2021 Report*, 36 FCC Rcd at 865-68, paras. 45-47; *2018 Report*, 33 FCC Rcd at 1698-1703, paras. 72-78; *2016 Report*, 31 FCC Rcd at 743-48, paras. 98-113; *2015 Report*, 30 FCC Rcd at 1429-35, paras. 91-99.

¹³⁴ See *2022 Form 477 Order*, FCC 22-93, at 6, para. 13. The continuing collection of FCC Form 477 subscribership data is in contrast to FCC Form 477 deployment data, which has been sunset. See generally *2022 Form 477 Order*.

¹³⁵ For purposes of this report, a census tract can be designated as “urban core” if it has a land area less than three square miles and a population density of at least 1,000 people per square mile. We designate a census tract as “Non-urban core” if we have not designated the census tract as urban core. A census tract is designated as Tribal lands if at least 50 percent of the land area is on Tribal Lands.

¹³⁶ Census tracts generally have a population size between 1,200 and 8,000 people, with an “optimum” size of 4,000 people. United States Census Bureau, *Glossary*, <https://www.census.gov/programs-surveys/geography/about/glossary.html> (last visited Oct. 23, 2023). Missouri, with a state-wide population of roughly six million, has 1,393 census tracts. United States Census Bureau, *Missouri*, <https://www.census.gov/geographies/reference-files/2010/geo/state-local-geo-guides-2010/missouri.html> (last visited Oct. 23, 2023).

¹³⁷ See, e.g., National Telecommunications and Information Administration, United States Department of Commerce, Digital Nation Research Center, <https://www.ntia.doc.gov/page/digital-nation-research-center> (last visited Oct. 23, 2023) (sampling discussed under heading “Using Datasets to Calculate Statistics”); United States

(continued....)

subscription levels in a particular geographic area by multiplying the survey results by the population of the pertinent area? Are subscribership estimates provided at a sufficient level of geographic granularity to be useful, such as delineating between urban, rural, and Tribal areas? We seek comment on how regularly these data are published and how they compare to the vintage of data the Commission will be producing. How should we reconcile any differences in the vintages of the data? To what extent do these potential data sources differentiate between broadband service speeds in a manner that would be useful to our analysis? Are there any other potential sources of subscription (or more directly, adoption) data? What are the strengths and weaknesses of such sources?

D. Availability

62. When discussing the universal service goal of availability of service, we refer to consumers' ability to purchase broadband service in areas where service is physically deployed.¹³⁸ For instance, broadband service may be physically deployed to a location but the wiring of a building does not support all of its tenants. For purposes of this universal service goal and in the context of this inquiry, we seek comment on factors that lead to a service being physically deployed but unavailable in certain locations.¹³⁹ Are there other elements of service availability that we should consider? For instance, should this goal be understood to encompass the quality of broadband service, including for example the frequency of service outages? If so, what criteria should the Commission rely upon to define availability for the purposes of this inquiry? Is there quantitative or qualitative data that the Commission can rely upon to analyze service availability for this purpose?

E. Equitable Access

63. Available data suggests that minority groups often do not have the same access to broadband. For example, we note that according to at least one Pew Research Center survey, while 80% of white adults reported having home broadband access, only 71% of Black adults, and 65% of Hispanic adults, had such access.¹⁴⁰ In addition, the subscription figures for the Affordable Connectivity Program indicate that 54.2% of the program subscribers chose to use their monthly benefit for mobile broadband compared to less than 45.8% that used their subsidy for fixed services.¹⁴¹ What can we infer from these statistics? Can we identify a lack of equitable access from the revealed preferences of consumers given their overall service requirements and budget constraints? Moreover, the lack of broadband availability on Tribal Lands appears to be particularly acute.¹⁴² Are there steps that the next report can and should

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Census Bureau, American Community Survey Design and Methodology (January 2014) (2014), <https://www.census.gov/history/pdf/acsdesign-methodology2014.pdf>.

¹³⁸ See *USF Report*, FCC 22-67, at para. 12.

¹³⁹ Our use of the term “availability” in this proceeding should therefore be distinguished from our use of the term in implementing the Broadband DATA Act, and in establishing the BDC. See 47 U.S.C. § 642(a)(1)(A); *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505, 7510-11, para. 13 (2019) (fixed); *Establishing the Digital Opportunity Data Collection*, WC Docket No. 19-195, Order, 37 FCC Rcd 3007 (WTB/OEA/OET Mar. 9, 2022) (mobile).

¹⁴⁰ Sara Atske & Andrew Perrin, *Home Broadband Adoption, Computer Ownership Vary by Race, Ethnicity in the U.S.* (July 16, 2021), <https://www.pewresearch.org/fact-tank/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicity-in-the-u-s/>. See also, e.g., Paul Flahive, *Who Gets 5G — And Who Gets Left Behind — Has Some Worried About Digital Inequality* (Feb. 25, 2020), <https://www.npr.org/2020/02/25/809012775/who-gets-5g-and-who-gets-left-behind-has-some-worried-about-digital-inequality>.

¹⁴¹ See Universal Service Administrative Co., Additional ACP Data, <https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/additional-acp-data/> (last visited Oct. 23, 2023).

¹⁴² See Section IV.A.3, *supra*.

take to address diversity, equity, inclusion, and accessibility? What additional steps can the Commission take to promote equitable access to broadband?

64. The Commission, as part of its continuing effort to advance digital equity for all, including people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality, invites comment on any equity-related considerations¹⁴³ and benefits (if any) that may be associated with the proposals and issues discussed herein. Specifically, we seek comment on how our proposals may promote or inhibit advances in diversity, equity, inclusion, and accessibility, as well the scope of the Commission's relevant legal authority.

V. DETERMINING THE NEXT SECTION 706 FINDING

65. We seek comment on how our analysis of the universal service goals of universal deployment, affordability, adoption, availability, and equitable access to broadband should inform our section 706 inquiry regarding “the availability of advanced telecommunications capability to all Americans” and our determination as to whether “advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.”¹⁴⁴ If universal access is the benchmark by which we should examine physical deployment, what benchmarks should we use to evaluate our other goals of adoption, availability, and equitable access? Can anything less than universal access in these areas be sufficient to reach a positive finding under section 706? How do we adequately determine if these goals have been fulfilled to sufficiently merit a positive section 706 finding?

66. Are any issues with the available data significant enough, either individually or cumulatively, to prevent us from making a definitive finding under section 706, regardless of what the data may show? If commenters believe this to be the case, would use of any supplemental sources or methods of verification be sufficient to allow us to make a definitive finding? Is there sufficient data to evaluate the proposed non-deployment universal service goals?

67. Section 706 states that if we make a negative finding as to the availability of advanced telecommunications capability, we are required to “take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”¹⁴⁵ If we do, in fact, make a negative finding, what actions should the Commission take to further our universal service goals for broadband, both in the immediate future and over the long-term? More specifically, what can the Commission do to further promote competition? Are there currently regulatory barriers that exist which impede broadband deployment or investment that the Commission should consider eliminating? We recognize the recent significant private sector investments to deploy broadband.¹⁴⁶ Are there additional efforts the Commission can undertake to encourage more private investment in broadband buildout? Would a long term strategy to coordinate

¹⁴³ The term “equity” is used here consistent with Executive Order 13985, to mean “as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.” See Exec. Order No. 13985, 86 Fed. Reg. 7009, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (Jan. 20, 2021).

¹⁴⁴ 47 U.S.C. § 1302(b).

¹⁴⁵ *Id.*

¹⁴⁶ See, e.g., ACA Connects, Closing the Gaps, <https://acaconnects.org/closing-the-gaps/> (last visited Oct. 23, 2023); NCTA, Broadband Stats: Cable's Network Investment, <https://www.ncta.com/whats-new/broadband-stats-cables-network-investment> (last visited Oct. 23, 2023); USTelecom, 2022 Broadband Capex Report, <https://www.ustelecom.org/research/2022-broadband-capex/> (last visited Oct. 23, 2023).

Federal broadband programs, as recommended last year by GAO,¹⁴⁷ help to advance the goals of this inquiry? We also seek comment on whether additional waste, fraud, and abuse protections within the Universal Service Fund and other FCC programs would help advance the goals of this inquiry.

VI. PROCEDURAL MATTERS

68. *Ex Parte Presentations.* This proceeding shall be treated as a “permit-but-disclose” proceeding pursuant to the Commission’s *ex parte* rules.¹⁴⁸ Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda, or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (for example, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules.

69. *Comment Filing Procedures.* Pursuant to sections 1.415 and 1.419 of the Commission’s rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission’s Electronic Comment Filing System (ECFS). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <https://www.fcc.gov/ecfs/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing.
- Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail.¹⁴⁹ All filings must be addressed to the Commission’s Secretary, Office of the Secretary, Federal Communications Commission.

¹⁴⁷ See U.S. Government Accountability Office, National Strategy Needed to Guide Federal Efforts to Reduce Digital Divide at 35 (2022), <https://www.gao.gov/assets/gao-22-104611.pdf>.

¹⁴⁸ 47 CFR §§ 1.1200 *et seq.*

¹⁴⁹ Due to the COVID-19 pandemic, the Commission closed its hand-delivery filing location at FCC Headquarters effective March 19, 2020. See FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Filing, Public Notice, 35 FCC Rcd 2788 (2020). As a result, hand or messenger delivered filings in response to this Notice of Proposed Rulemaking will not be accepted. Parties are encouraged to take full advantage of the Commission’s various electronic filing systems for filing applicable documents. Except when the filer requests that materials be withheld from public inspection, any document may be submitted electronically through the Commission’s ECFS. See 47 CFR § 1.49(f)(3). Persons that need to submit confidential filings to the Commission should follow the instructions provided in the Commission’s March 31, 2020 public notice regarding the procedures for submission of confidential materials. See *FCC Provides Further Instructions Regarding Submission of Confidential Materials*, Public Notice, 35 FCC Rcd 2973 (2020).

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street, NE, Washington, DC 20554.

70. *People with Disabilities.* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).

71. *Contact Person.* For further information about this proceeding, please contact David Brodian, FCC Wireline Competition Bureau, Competition Policy Division, 45 L Street, N.E., Washington, D.C. 20554, 202-418-0825, David.Brodian@fcc.gov.

VII. ORDERING CLAUSE

72. Accordingly, IT IS ORDERED, that pursuant to section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302, this Notice of Inquiry IS ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

**STATEMENT OF
CHAIRWOMAN JESSICA ROSENWORCEL**

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 22-270, Seventeenth Section 706 Report Notice of Inquiry (October 25, 2023).

The pandemic made crystal clear that access to broadband is no longer just nice-to-have, it is need-to-have for everyone, everywhere. When so many of us had to readjust to life in lockdown, we turned online for our community, education, work, healthcare, and more. During this time and even before it, the needs of internet users surpassed the Federal Communications Commission's standard for broadband of 25 Megabits per second down and 3 Megabits per second up. This standard is not only outdated, it masks the extent to which low-income neighborhoods and rural communities are being left offline and left behind. Ultimately, I believe it is essential in the United States to set big goals in order to get big things done. That is why we are kicking off this inquiry to update our national broadband standard to better align it with the standards in pandemic-era legislation of 100 Megabits per second down and 20 Megabits per second up and also set a long-term goal for gigabit speeds.

**STATEMENT OF
COMMISSIONER BRENDAN CARR
APPROVING IN PART AND CONCURRING IN PART**

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 22-270, Notice of Inquiry (October 25, 2023).

In the years leading up to 2018, the FCC used the Section 706 proceeding to ask whether 100% of Americans already have access to advanced telecommunications capability. Of course, this answers the wrong question—or, more specifically, it fails to answer the question Congress posed to the Commission in Section 706 of the Telecommunications Act of 1996. The Commission corrected this error with the inquiries we conducted from 2018 to 2020.

In Section 706, Congress determined that the Commission “shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.” It then directs the Commission to conduct an inquiry to determine “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.” If it is not, Section 706 states that the Commission “shall take immediate action to accelerate deployment of such capability.”

During the prior Administration, the FCC’s Section 706 reports properly read the statute as directing the Commission to measure the *progress* that providers of advanced telecommunications capability are making in deploying those capabilities to all Americans and to determine whether such progress is reasonable and timely. Reading Section 706 as directing the Commission to determine whether advanced telecommunications capability has already been deployed to 100% of Americans reads the “reasonable and timely” language out of the statute and is inconsistent with Congress’s use of the present progressive tense “is being deployed.” This conclusion is further reinforced by the language Congress used for FCC inquiries that result in a negative determination. In such cases, Congress states that the Commission “shall take immediate action to accelerate deployment,” thus confirming Congress’s focus in Section 706 on the pace of deployment and the progress that providers are making.

As a policy matter, it makes sense that Congress would task the Commission with this type of progress-based inquiry. Assessing the pace at which advanced telecommunications capability is being deployed provides far more—and more helpful—information to Congress and to the public than a binary inquiry into whether or not 100% of Americans already have access to such capability. In fact, it makes no sense to read the statute as requiring the FCC to answer that latter question. There is simply no need to run an entire administrative proceeding to answer it.

In the Section 706 reports issued under the prior Administration, the Commission reoriented the inquiry to align with our statutory directive—namely, whether broadband “is being deployed . . . in a reasonable and timely fashion.” Those reports rightly focused on the *pace* of deployment, not whether the U.S. has already achieved “universal availability of advanced telecommunications capability.”

So, I was disappointed but not surprised to see that this NOI proposes to torture the language of Section 706 once again by focusing on whether or not 100% of Americans have access to advanced telecommunications capability—an inquiry that plainly does not require a record. But of course, that is the point. We all know where this is going. The FCC is not going to use this proceeding to shed light on the pace of broadband build—although, I have to say, it will be interesting to see how this FCC grades the Biden Administration on the progress it is making towards its promised goal of “Internet for all.”

As for the item before us today, I do appreciate that my colleagues agreed to make some meaningful changes to the draft to improve the scope of the inquiry.

For one, the NOI now seeks specific comment on whether the agency should maintain its focus on the pace of progress that covered providers are making. In doing so, the NOI now solicits additional data to quantify recent builds and new service offerings.

For another, the NOI now takes a more holistic approach to the question of setting broadband speed metrics and other benchmarks. I have no objection to identifying aggressive speed or other goals. By all means, let's shoot for the moon. As we do so, we must, consistent with Section 706 itself, not define advanced telecommunications capability in a manner that narrowly focuses on one specific technology. Indeed, the statute requires the FCC to proceed "without regard to any transmission media or technology." As Section 706 indicates, the FCC should be looking first to identify the voice, video, and data applications that consumers are demanding and then, as a second step, adopt metrics that define advanced telecommunications capability based on that determination. Not the other way around. So I am pleased that the NOI now asks for comment along these lines.

For yet another, the NOI now seeks more even-handed comment in several places. For instance, it now seeks comment on whether or not competing mobile and fixed technologies should be viewed as substitutes, rather than proposing a conclusion here.

Finally, the NOI now includes new lines of inquiry. It asks whether the government should adopt a national coordinating strategy that covers the various federal broadband programs, as GAO recommended last year. It asks whether the FCC should remove barriers to broadband builds. And it asks whether the FCC should include new protections against waste, fraud, and abuse in the agency's USF programs as a means of advancing the Commission's Section 706 goals.

Ultimately, while I still have serious concerns regarding the orientation of this Section 706 inquiry, I believe these revisions will help create a robust record. As a result, I approve in part and concur in part.

**STATEMENT OF
COMMISSIONER GEOFFREY STARKS**

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*; GN Docket No. 22-270, Seventeenth Section 706 Report Notice Of Inquiry (October 25, 2023).

I'm glad that with this *Notice* we begin the process to complete our statutorily required annual assessment concerning the "availability of advanced telecommunications capability to all Americans."¹⁵⁰ We last issued this Congressionally-mandated report in 2021,¹⁵¹ and since then much has changed in the broadband marketplace. So, I support the *Notice's* proposal to update our broadband benchmark to 100 Mbps download speed and 20 Mbps upload speed to be responsive the current reality consumers encounter. In proposing to increase our broadband benchmark, we would establish a target that matches speeds now required in many of our Universal Service Fund programs,¹⁵² as well as those required in other federal broadband programs, including BEAD.¹⁵³ The alternative is to retain a benchmark that was originally adopted in 2015,¹⁵⁴ and that has been outdated for years.

I support seeking comment on the *Notice's* aspirational long-term speed goal of 1 gigabit download speed/500 Mbps upload speed. As innovation and technology continue to increase, including real-time use cases and new advances like telehealth and AI, we must set a long-term target that allows us and broadband providers to support the next breakthroughs in the future.

I am also pleased to see that this Notice considers adoption and affordability, which can go hand in hand. And to that end, this item has my full support.

¹⁵⁰ 47 U.S.C. § 1302(b).

¹⁵¹ *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 20-269, Fourteenth Broadband Deployment Report, 36 FCC Rcd 836 (Jan. 19, 2021).

¹⁵² See e.g., *Connect America Fund: A National Broadband Plan for Our Future High-Cost Universal Service Support*, WC Docket 10-90 *et al.*, Report and Order, Notice of Proposed Rulemaking, and Notice of Inquiry, FCC 23-60, para. 19 (July 23, 2023).

¹⁵³ *Notice of Funding Opportunity*, Broadband Equity, Access, and Deployment Program, National Telecommunications and Information Administration at 64 ("Funded Networks shall deliver Reliable Broadband Service with speeds of not less than 100 Mbps for downloads and 20 Mbps for uploads"), available at <https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf>.

¹⁵⁴ *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*, GN Docket 14-126, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, 1403, para. 25 (Jan. 29, 2015).

**STATEMENT OF
COMMISSIONER NATHAN SIMINGTON
APPROVING IN PART AND CONCURRING IN PART**

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 22-270, Notice of Inquiry (October 25, 2023).

In addition to sharing Commissioner Carr’s concerns about the misframing of our inquiry, I am also concerned by the suggestion that the FCC adopt a “long-term speed goal” of 1000/500Mbps for the definition of broadband. All else being equal, no one would choose 100/20Mbps service over 1000/500Mbps service, but the vast majority of consumers do not materially benefit from such high speeds, and deploying such high-speed service is not free. A 100/20Mbps connection is fast enough to watch multiple 4K-quality streams, make multiple video calls, and play multiple online games, all at the same time. New applications may one day require more bandwidth, but it is premature to set a target based on hypothetical use cases that may not materialize or, that when they do, might require even more than 1000/500Mbps anyway.

This is not a mere rhetorical concern. Adopting a long-term target of 1000/500Mbps would send the message that in the near future, the FCC will consider speeds below that to be inadequate. By operation of the principles that have long guided our high-cost programs, this would put ISPs on notice that the FCC could soon subsidize competitors in any area where 1000/500Mbps connections are not available. Subsidized competition undermines the already tenuous profitability of rural ISPs, so they will choose to invest their limited resources into serving fewer locations at 1000/500Mbps, thereby protecting themselves from future subsidized competition, rather than into serving more locations at lower but very adequate speeds such as 100/20Mbps or 200/100Mbps. The bottom line is that more Americans would be left unserved because the FCC pursued science fiction instead of sober policy.