Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Timely and Reasonable Fashion	))))	**Docket No. 25-223**

Comments of

NTCA-THE RURAL BROADBAND ASSOCIATION
CONTENT

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EXECUTIVE SUMMARY

NTCA urges the Commission to conduct its Section 706 inquiry through a forward-looking framework that assesses whether current infrastructure investments can meet both present and reasonably anticipated future market demands. The statutory mandate to evaluate "advanced telecommunications capability" deployment must be interpreted consistent with the Communications Act's recognition of telecommunications services as "evolving" capabilities that advance over time, rather than static standards destined for obsolescence. Current market data demonstrates rapidly increasing demand for higher-capacity services driven by substantial growth in telework, telehealth adoption, online education, precision agriculture, entertainment and e-commerce, and emerging AI applications requiring intensive symmetrical connectivity. Speed benchmarks must align with rapidly advancing market demands rather than conservative minimums.

NTCA also urges the Commission to address regulatory barriers hindering deployment, particularly costly and time-consuming rights-of-way and permitting processes that create unpredictable delays for rural providers. Proper rural definitions that avoid diluting targeted policies through overly broad classifications will remain essential for effective deployment strategies. Finally, NTCA recommends the Commission to maintain its recognition that fixed and mobile broadband services are complementary rather than substitutable, each serving distinct use cases that together support comprehensive digital participation and economic resilience in both rural and urban communities.

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To the Commission:

I. INTRODUCTION

NTCA-The Rural Broadband Association (NTCA) hereby submits comments in the above-captioned proceeding.[1] Section 706 of the Telecommunications Act of 1996, as amended, requires the Commission to determine and report annually on "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."[2] The Commission then, as it has since 1999,[3] uses findings from this inquiry to prepare an annual report to Congress describing the status of broadband deployment throughout the United States. In these instant comments, NTCA urges the Commission to hold

[1] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion: Nineteenth Section 706 Report Notice of Inquiry,* Docket No. 25-233, FCC 25-46 (2025). (NOI).

[2] 47 U.S.C. § 1302(b).

[3] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996: Report,* Docket No. 96-146, FCC 99-5 (1999).

each question of the NOI before a common lens, namely: Do Americans, no matter where they live, have access to broadband that can reasonably meet evolving capabilities and market demands? Stated differently, NTCA urges the Commission to cast the *present tense* approach of the statutory question ("Is broadband being deployed?") in a manner that ensures not only that current deployments are poised to meet current market demands, but that current deployments are on track to meet reasonably anticipated needs.

NTCA is keenly interested in these issues. NTCA represents more than 850 locally operated broadband providers in rural areas throughout the United States. As the leading trade association focused on rural broadband issues, and representing providers who understand that the deployment of a network is most efficient and effective when assessing demand for that network over its useful life, NTCA studies the Section 706 question as contemplating current and reasonably anticipated uses of broadband. NTCA devotes substantial attention to the role of broadband in agriculture,[4] economic development,[5] education,[6] healthcare,[7] and other critical

[4] Seidemann, J., "From Fiber to Field: The Role of Rural Broadband in Emerging Agricultural Technology," Smart Rural Community, NTCA–The Rural Broadband Association (2021) (https://www.ntca.org/sites/default/files/documents/2021-07/06.14.21%20SRC%20Ag%20Tech%20Final.pdf) (visited Sep. 2, 2025).

[5] Seidemann, J., "Key Point Indicators for Rural Economic Development," National Rural Economic Developers Association and Smart Rural Community/NTCA–The Rural Broadband Association (2024) (https://www.ntca.org/sites/default/files/documents/2024-05/KPIs_For_Rural_Economic_Development.pdf) (2024).

[6] Seidemann, J., "Rural Broadband and the Next Generation of American Jobs," Smart Rural Community, NTCA–The Rural Broadband Association (2019) (https://www.ntca.org/sites/default/files/documents/2021-03/SRC_whitepaper_the_next_generation_of_american_jobs.pdf) (visited Sep. 3, 2025).

[7] Seidemann, J., "Extended Reality Telehealth for Rural Spaces," Smart Rural Community, NTCA–The Rural Broadband Association (2024) (https://www.ntca.org/sites/default/files/documents/2024-12/Extended_Reality_Telehealth_for_Rural_Spaces.pdf) (visited Sep. 2, 2025).

sectors that support sustainable and successful futures for rural spaces. NTCA also heeds market and technology trends including rapidly increasing deployment of IoT capabilities in consumer and industrial applications; “work from anywhere” telework initiatives; and explosive use of AI tools across many consumer and industrial sectors. Accordingly, NTCA recommends the Commission to ask not simply whether *any* type of broadband is being deployed, but whether *broadband that meets user needs* is being deployed. It is through this lens that the salient questions of the NOI are best addressed.

II. DISCUSSION

A. A TECHNOLOGY NEUTRAL APPROACH DOES NOT SUPPLANT A SECTION 706 INQUIRY THAT ASSESSES USER ACCESS TO CRITICAL SERVICES AND APPLICATIONS.

While the Commission states its intent to address broadband deployment in a "technologically neutral manner," the fundamental question of whether broadband is being deployed should be answered "Yes" only if that broadband can meet reasonably anticipated demands both now and over the useful lives of the networks being deployed. Current usage data, evidenced by substantial growth in telework, telehealth, online education, entertainment and e-commerce, and precision agriculture applications, provides essential insight into the capabilities that will be necessary to support both rural and urban connectivity requirements. Stated differently, any meaningful assessment of efficient and effective deployment progress must examine whether the broadband being deployed today possesses the capacity to accommodate emerging usage patterns, ensuring that critical infrastructure investments deliver lasting value rather than create tomorrow's stranded assets.

As the Commission asks how it can most effectively address broadband deployment in a "technologically neutral manner,"[8] it explains that it invokes this approach "based on what the statute directs us to determine: 'whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.'"[9] NTCA agrees that the Commission's focus is proper – the salient question is whether "advanced telecommunications capability" is being deployed. However, answering that question requires considering whether the capabilities being deployed today will meet evolving user needs, including not only needs that evolve within the annual Section 706 reporting cycle, but reasonably anticipated demands as well. Just NTCA members who build networks intended to last for at least a few decades, present-day broadband initiatives must incorporate forward-looking capacity planning, with capabilities that will adapt to growing demand and emerging technologies. The Telecommunications Act of 1996[10] itself supports this future-focused approach. In its Universal Service provisions, the Act defines covered services as "evolving" levels of service.[11] Congress clearly recognized that bringing "advanced telecommunications capability" to all Americans would not be served by relying on static standards that could leave users stranded as communications technology races forward.

[8] NOI at para. 2.

[9] NOI at para. 2.

[10] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) (1996 Act). The 1996 Act amended the Communications Act of 1934 and is codified at 47 U.S.C. § 151 *et seq.*

[11] 47 U.S.C. § 254(c)(1).

To be sure, the Commission explains that in the 2024 Section 706 report, it "departed from the way that the section 706 inquiry had historically been conducted by for the first time reading several extraneous universal service criteria into the section 706 statutory inquiry based upon its interpretation of Congressional intent."[12] Specifically, the NOI cites the 2024 report as incorporating universal service goals of deployment, adoption, affordability, availability, and equitable access as "the metrics for conducting the section 706 inquiry."[13] The Commission now proposes to "reorient the section 706 inquiry back to the plain language of the statute" and to set aside the expanded scope adopted in the 2024 report.[14] The Commission further explains that this approach would be consistent with the Supreme Court's decision in *Loper Bright Enterprises v. Raimondo* and that decision's directive to adhere to clear statutory language. Without addressing the propriety of the criteria added by the 2024 report, NTCA suggests that the present inquiry can nevertheless incorporate the Universal Service perspective of "evolving level" of services, along with prior Commission statements, to inform a Section 706 inquiry that examines networks' ability to meet future market demands.

Since the Act does not define "advanced telecommunications services," established canons of statutory interpretation apply the plain meaning rule, examining dictionary definitions, statutory context, and the meaning of the word at the time the statute was written.[15] The word

[12] NOI at para. 5.

[13] NOI at n.8.

[14] NOI at para. 5.

[15] *See, i.e., Caminetti v. United States,* 242 U.S. 470, 471 (1917) ("Statutory words are presumed, unless the contrary appears, to be used in their ordinary sense, with the meaning commonly attributed to them."); *see, also,*

"advanced" means "greatly developed beyond an initial stage."[16] This definition encompasses a vision that distinguishes between *initial* services and those that over time feature *enhanced* capabilities that exceed prior functionalities and meeting anticipated future demands. This approach is corroborated by the Section 254 definition of Universal Service as "an evolving level of telecommunications services . . . *taking into account advances in telecommunications and information technologies and services.*"[17] Invoking principles of holistic interpretation, (specifically, interpreting statutes so that similar language has a consistent meaning throughout the statute)[18], these sections (254 and 706) together evidence Congressional awareness that telecommunications services advance technologically over time and that policies should accommodate such advances, rather than freeze capabilities at a single moment in time. Moreover, the Commission itself has articulated its interest in ensuring that networks can meet future demand: More than 20 years ago, the Commission declared its intent to create policies that would "foster investment and innovation" in networks that "will support future broadband capabilities and applications."[19]

States v. Public Utilities Comm'n of the District of Columbia, 345 U.S. 295, 315 (1953) ("Where the language and purpose of the questioned statute is clear, courts, of course, follow the legislative direction in interpretation.")

[16] *See,* Merriam-Webster Dictionary (online) (https://www.merriam-webster.com/dictionary/advanced) (visited Sep. 3, 2025).

[17] 47 U.S.C. 254(c)(1) (emphasis added).

[18] *See, i.e., Gustafon v. Alloyd Co., Inc.* 513 U.S. 561, 562, 570 (1995) ("The normal rule of statutory construction that identical words used in different parts of the same Act are intended to have the same meaning . . ."). This principle is also known as "whole act" or "harmonious construction."

[19] *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities; Universal Service Obligations of Broadband Providers; Computer III Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements: Notice of Proposed Rulemaking,* Docket Nos. 02-33, 95-20, 98-10, FCC 02-42, at para. 5 (2002).

This approach (to inform Section 706 from the perspective of Section 254) does not conflict with *Loper Bright Enterprises.* The doctrine of *in pari materia* requires that statutes addressing the same subject matter be interpreted consistently, not only to avoid internal contradictions but - more important for the instant proceeding – to effectuate overall legislative purpose.[20] Both Sections 254 and 706 address a common policy objective: to ensure nationwide deployment of telecommunications services that are intended to advance over time. If Section 254 explicitly recognizes that telecommunications services evolve and advance over time, then the Section 706 inquiry into "advanced telecommunications services" deployment must be interpreted consistent with that evolutionary framework. The Section 706 mandate to assess deployment of advanced services would be rendered meaningless if it answered only whether services capable of meeting today's needs are being deployed. Congress could not have intended to require ongoing support for evolving advanced services in Section 254 while measuring their deployment with a yardstick of static definitions in Section 706.

With this in mind, NTCA then turns to assessing "what is" advanced telecommunications capability by examining current market trends and data. In July 2025, the median download speed for fixed broadband in the United States was 285.39 Mbps and the median upload speed was 47.86 Mbps;[21] median fixed upload speeds alone increased 16% since the past year.[22] NTCA

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[20] Antonin Scalia & Bryan A. Garner, *Reading Law: The Interpretation of Legal Texts* 252 (West 2012) ("[L]aws dealing with the same subject—being *in pari materia*—should if possible be interpreted harmoniously.")

[21] "United States Median Country Speeds Updated July 2025," Speedtest Global Index (https://www.speedtest.net/global-index/united-states) (visited Aug. 28, 2025).

[22] *Id.*

has similarly documented increasing demand for higher-capacity broadband services among its members' subscribers, with subscriptions to services of 100 Mbps and higher increasing from 2023 to 2024, with demand for services less than 100 Mbps declining during that same period.[23]

Against this backdrop, NTCA urges the Commission to address the question of whether broadband that reflects market trends *where they are* and *where they are anticipated to grow* is being deployed. Industry and policymakers must avoid outcomes that are outdated before the ink on their promulgation dries. Use case demand from several sectors demonstrates these evolving needs:

- The U.S. Bureau of Labor Statistics reports that nearly 23% of Americans (more than 34 million) telework, a 3.3% increase from 2023 to 2024.[24]
- In 2023, 96% of Health Resources and Services Administration (HRSA) funded facilities used telehealth to provide primary care services;[25] in 2024, 25% of Medicare Part B Users engaged a telehealth service;[26] a 2024 survey found that 54% of Americans have used telehealth with high rates of satisfaction.[27]

[23] *See,* "Broadband/Internet Availability Survey Report," NTCA–The Rural Broadband Association, at 9 (Arlington, VA) (Dec. 2024) (https://www.ntca.org/sites/default/files/documents/2025-01/2024-broadband-internet-availability-report.pdf) (visited Aug. 28, 2025).

[24] Connor Borkowski and Rifat Kanyas, "Telework Trends," Beyond the Numbers, U.S. Bureau of Labor Statistics (Mar. 2025) (https://www.bls.gov/opub/btn/volume-14/telework-trends.htm) (visited Aug. 28, 2025).

[25] "Telehealth Trends," U.S. Department of Health and Human Services (https://telehealth.hhs.gov/research-trends) (visited Sep. 3, 2025).

[26] "Medicare Telehealth Trends Report," at 5 (May 2, 2025) (https://data.cms.gov/sites/default/files/2025-06/Medicare%20Telehealth%20Trends%20Snapshot%2020250527_508.pdf) (visited Sep. 3, 2025).

[27] "2024 National Telehealth Survey," Public Opinion Strategies (Mar. 4, 2024) (https://pos.org/2024-national-telehealth-survey/) (visited Aug. 28, 2025).

- More than ten million American college students (representing 54% of all students) have taken at least one class online; nearly five million students (26%) take college classes exclusively online.[28]

  27% of U.S. farms and ranches use precision agriculture applications.[29]
- AI will require intensive symmetrical high-capacity, low-latency networks; data center capacity demand is anticipated to increase 70% by 2030.[30]

- As of July 2025, 83% of Americans use streaming video services;[31] the U.S. streaming video market is expected to increase 33% over the next four years to reach $112.7 billion.[32]

- 2Q25 e-commerce sales reached $304.2 billion, a 1.4% increase from 1Q25.[33]

Among NTCA members alone, subscriptions to gigabit or higher services increased 17% from 2023 to 2024, while subscriptions to services ranging from 100 Mbps to one gigabit increased 13% during the same term. During that period, subscriptions to service tiers 100 Mbps

[28] Jessica Bryan, "Online Learning Statistics," Best Colleges (Jun. 30, 2025) (visited Aug. 28, 2025).

[29] "Precision Agriculture: Benefits and Challenges for Technology Adoption and Use," Government Accountability Office, at 12 (Jan. 2024).

[30] *See,* Seidemann, J., "AI Applications for Rural Broadband Providers," NTCA–The Rural Broadband Association, at 26 (internal citations omitted) (2025) (NTCA AI Applications) (https://www.ntca.org/sites/default/files/documents/2025-08/ai-application-paper.pdf) (visited Sep. 3, 2025).

[31] Eugenie Park and Colleen McClain, "83% of U.S. Adults Use Streaming Services, Far Fewer Subscribe to Cable or Satellite TV," Pew Research Center (Jul. 1, 2025) (https://www.pewresearch.org/short-reads/2025/07/01/83-of-us-adults-use-streaming-services-far-fewer-subscribe-to-cable-or-satellite-tv/) (visited Sep. 8, 2025).

[32] Todd Spangler, "U.S. Streaming Video Market to Surge 33% by 20290 to Over $112 Billion, PwC Forecasts," Variety (Jul. 23, 2025) (https://variety.com/2025/tv/news/us-streaming-video-market-size-forecast-2029-112-billion-pwc-1236467025/) (visited Sep. 8, 2025) (Spangler).

[33] "Quarterly Retail E-Commerce Sales," U.S. Census Bureau, CB25-122 (Aug. 9, 2025) (https://www.census.gov/retail/ecommerce.html) (visited Sep. 8, 2025).

and lower all declined, evidencing consumer migration to higher speed offerings.[34] These trends indicate that users (both consumer and industrial) are embracing increasingly higher demands for capability, scalability, reliability, and security.

NTCA urges the Commission to approach the Section 706 question as, "Is advanced telecommunications capability that meets current *and reasonably anticipated* market demands being deployed in a reasonable and timely fashion?" This question can be asked without regard to technology platforms, though each technology platform's capabilities will inevitably factor into the answer to the question. This approach transcends a purely technical definition of broadband to a qualitative inquiry that is laser focused on user needs. This approach is wholly consistent with the Act's recognition that advanced communications services represent "an evolving level of services" – and that evolution is marked not only by the technology but also by the expanding purposes for which it is used. Congress cares about this evolution because it anticipated nearly three decades ago the potential of American achievement through advanced broadband networks.

And while the Commission suggests that "[a]t present, it is impossible to predict long-term technological developments and the evolution of consumer preferences,"[35] the year-on-year increases in broadband capabilities and ever-evolving technological achievements adjure us to take a classic Shakespearean observation as a modern charge to action: "What's past is

[34] "NTCA Broadband/Internet Availability Survey Report," NTCA–The Rural Broadband Association, at 9 (2024) (https://www.ntca.org/sites/default/files/documents/2025-01/2024-broadband-internet-availability-report.pdf) (visited Sep. 3, 2025).

[35] NOI at para. 11.

prologue."[36] As described above, broadband and the technologies that it enables are on a trajectory of irreversible forward momentum. While it may be impossible to predict the specific applications that will emerge or the specific level of performance that might be deemed "baseline" years into the future, extended reality (XR) telehealth (including substantial investments from the U.S. Department of Veterans Affairs),[37] cloud-based precision agriculture,[38] explosive demand for AI capabilities,[39] and projected demand for streaming services[40] informs us that a relentless pace of development will fuel increasing demand for higher and higher capacity services and capabilities.

The Commission has recognized these implicit needs, asking, "How, if at all, will AI-driven, data-intensive applications redefine the minimum broadband speeds required for global competitiveness?"[41] A recent NTCA paper demonstrates that AI applications across numerous

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[36] William Shakespeare, "The Tempest," Act 2, Scene 1.

[37] For an overview of the Department of Veterans Affairs work on XR telehealth, *see,* "Re-Engaging Veterans in Pain through Extended Reality (VIPER): Virtual Reality," (Nov. 2023) (https://marketplace.va.gov/innovations/re-engaging-veterans-in-pain-through-immersive-technology) (visited Sep. 3, 2025).

[38] *See, i.e.,* "Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States," Federal Communications Commission, at 49, 57, 58, 67, 78 (Dec. 5, 2024) (https://www.fcc.gov/sites/default/files/PATF-report-final-122324.pdf) (visited Sep. 3, 2025).

[39] *See, i.e.,* Ray Aoki, "The Critical Role of Fiber Optic Cables in Network and AI Infrastructure," StarTech.com (Feb. 3, 2025) (https://www.startech.com/en-us/blog/the-critical-role-of-fiber-optic-cables-in-network?srsltid=AfmBOooFN_-Rsi2-KOu2uFBdKrLYPl00AJFbbIuHw461OdULWB2Ziic0) (visited Sep. 3, 2025); James Moody, "Ciena Global Survey Explores Networking Needs for AI Era," Ciena (Mar. 17, 2025) (https://www.ciena.com/about/newsroom/press-releases/global-survey-explores-networking-needs-for-ai-era) (visited Sep. 3, 2025).

[40] *See,* Spangler, *supra* n.32.

[41] NOI at para. 11.

sectors including agriculture, rural economic development, education, and healthcare will demand not only higher speeds for users but also fundamental reassessments of core broadband network capabilities.[42] Moreover, these connections will require symmetrical capabilities to enable critical training functions on which AI capabilities rely. Broadband standards, accordingly, will derive not only from consumer needs but computational and connectivity requirements for industrial and commercial needs (and this is apart from data centers which themselves create extraordinary bandwidth demands for hyperscalers).

In sum, the Commission's Section 706 inquiry should embrace a forward-looking interpretation of "advanced telecommunications capability" that contemplates both current usage patterns and anticipated market demands. The overall statutory framework – *in pari materia* – that focuses on "advanced" and "evolving" services requires an assessment that reaches beyond today's minimum requirements to determine whether deployed infrastructure can adapt to future needs. Current data demonstrates rapid migration to higher-capacity services. Combined with growing demands from telework, telehealth, online education, emerging AI applications, entertainment, and e-commerce, NTCA urges the Commission to frame its Section 706 analysis around whether broadband networks capable of meeting current *and anticipated* market demands are being deployed in a reasonable and timely fashion. This approach is consistent with both the plain language of the statute and implicit underlying principles that broadband deployment cannot be measured by standards destined for obsolescence.

[42] NTCA AI Applications, *supra* n.30.

B. ASSESSING THE PROGRESS OF BROADBAND DEPLOYMENT RELIES ON COMPARATIVE DATA FROM PRIOR PERIODS.

The Commission asks for "objective data and other evidence reflecting the state of broadband deployment and availability."[43] This approach is a proper, fundamental element in "complet[ing] this statutorily mandated task,"[44] as one cannot answer questions of quantified achievement without quantifiable data. At the same time, an inquiry into whether broadband "is being deployed" (as opposed to "has been deployed," which the Commission appears to eschew)[45] must examine prior periods for meaningful context.[46]

Here, NTCA parses this distinction to answer the question properly. "Is being deployed" suggests a moment in time - a snapshot of an indeterminate period. Is broadband being deployed today? This week? This quarter? Presumably, the annual reporting cycle of Section 706 points to whether broadband is being deployed *this year.* To answer that question meaningfully, one must compare current deployment activities to prior periods. Any inquiry into whether broadband is being deployed must include metrics that demonstrate progress over the term of inquiry as compared to prior earlier periods.

For purposes of this discussion, NTCA shares data gathered from its members over two periods: (A) 2023-2024, and (B) 2019-2024. Period A demonstrates that broadband is being deployed during the discrete phase of the Section 706 inquiry, while Period B provides

[43] NOI at para. 3.

[44] NOI at paras. 2, 3.

[45] NOI at para. 6.

[46] NOI at para. 6.

a comparative baseline that illustrates the longer-term achievements of NTCA's rural, locally operated broadband provider members.

Period A – 2023-2024

Infrastructure Increase: Fiber-to-the-premises deployment increased 2.75%.

Speed Availability: The percentage of customers with access to gigabit speeds increased 13.6%, from 67.1% to 76.4%.

Customer Adoption Acceleration: Subscriptions to 100+ Mbps service increased 14.85%.

Network Economics: Providers increased their middle mile bandwidth capacity 87.3% while cutting per-gigabyte costs by 40.7%, indicating significant infrastructure efficiency gains, but growing overall costs as demand for content increases.

Period B – 2019-2024

Infrastructure Transformation: Fiber-to-the-premises deployment increased from 69.9% to 85.8% of serviceable locations, while copper-dependent services dropped from 21.2% to 12.9%.

Speed Availability Surge: The percentage of customers with access to gigabit speeds took a quantum leap, jumping from 45.1% to 76.4% - a 31.3 percentage point increase.

Customer Adoption Acceleration: Perhaps most striking is the customer behavior shift. Subscriptions to 100+ Mbps services increased from 28.1% to 67.3% of customers, representing a 139% relative increase.

Network Economics: Providers tripled their middle mile bandwidth capacity while cutting per-gigabyte costs by 58.7%, indicating significant infrastructure efficiency gains, although overall middle mile costs continue to grow.[47]

[47] The NTCA Broadband/Internet Availability survey reports can be accessed at https://www.ntca.org/survey-reports (visited Sep. 3, 2025).

These data demonstrates that rural broadband providers have successfully executed large-scale network modernization while customers are rapidly adopting successively higher-speed service offerings as they become available. Simply, even under the dynamic perspective articulated in the prior section, it is clear that advanced services are being deployed in rural areas served by NTCA members.

C. THE COMMISSION HAS AUTHORITY TO EASE BARRIERS TO DEPLOYMENT.

The Commission seeks information on "regulatory barriers to deployment, expansion, competition, and technological innovation in such services."[48] NTCA has previously shared with the Commission information about barriers rural broadband providers face in deploying and maintaining networks, particularly the costly and time-consuming processes for obtaining rights-of-way (RoWs) and permits from state and local governments. NTCA members have experienced high and unpredictable fees, lengthy permitting delays, and additional burdens such as railroad crossing requirements, which together hinder timely and efficient rural broadband expansion. These challenges are compounded by rural-specific factors like sparse populations, difficult terrain, and short construction seasons. In a July 2025 *ex parte* meeting, NTCA urged the Commission to use its authority under Section 253 of the Act to curb unreasonable fees and delays, arguing that the same standards the Commission applied in 2018 to wireless deployment

[48] NOI at para. 3.

(such as limits on fees and shot clocks) should also be extended to wireline broadband infrastructure, ensuring fairer and faster rural deployment.[49]

D. BROADBAND SPEED BENCHMARKS MUST CONTEMPLATE THE ULTIMATE GOALS OF CONNECTIVITY.

The Commission seeks comment on whether it should continue using 100/20 Mbps as its benchmark in defining advanced telecommunications capability for fixed broadband.[50] In 2023, NTCA proposed the Commission adopt a near-term benchmark of "at least 100/20 . . . as an appropriate interim step."[51] NTCA would submit, however, that the market is continuing to evolve at a pace suggesting that this benchmark may soon be surpassed as a baseline. From 2020 to 2024, NTCA members reported a 51.9% relative increase to 1 Gbps service subscriptions and a 173.8% relative increase to subscriptions for services equal to or higher than 100 Mbps and less than 1 Gbps (a comprehensive five-year trends report of these and other data are presented in the Appendix to these comments). The Commission's stated goals in this report should align with rapidly advancing consumer demand for higher capacity services.[52]

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[49] *See, Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment; Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment: Ex Parte of NTCA–The Rural Broadband Association,* Docket Nos. 17-84, 17-79 (filed Jul. 2, 2025),

[50] NOI at para. 10.

[51] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion: Comments of NTCA–The Rural Broadband Association,* Docket No. 22-270, at 3 (Dec. 1, 2023).

[52] NTCA suggests a framework by which an aspirational, forward-looking benchmark framework could be designed. In the 2024 Section 706 report (*Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion: 2024 Section 706 Report,* Docket No. 22-270, FCC 24-27 (2024) (2024 Report)), the Commission declined to establish regular annual reviews of a long-term standard, or even to affix a term to it, stating they would "initially observe the market and investment trends before attaching a timeframe to our long-term goal." 2024 Report at paras. 50, 51. Moreover, the Commission noted that it viewed the long-term 1,000/500 goal as "aspirational," stating "we do not intend to use it as the measure to determine our

The Commission addresses this imperative, asking for comment on "how the benchmark that we select for defining advanced telecommunications capability may potentially impact the ability of individuals in rural communities and other underserved populations to fully participate in the digital economy."[53] In response, NTCA invokes the warning of Michelangelo: "The greater danger for most of us lies not in setting our aim too high and falling short, but in setting our aim too low and achieving our mark."

A peer-reviewed economic study found substantial improvements in economic conditions in rural areas with high rates of engagement with robust fiber broadband services, as compared to areas with low broadband utilization. Specifically, the study found:

- **213% higher business growth** - High-broadband rural areas gain businesses while low-broadband areas lose an average of 3+ businesses annually.
- **10% higher self-employment growth** - Broadband removes barriers to entrepreneurship by connecting rural residents to global markets, financing, and digital tools.
- **44% higher GDP growth** - High broadband usage creates a growth environment that strengthens local economic dynamism.
- **18% higher per capita income growth** (2020-2022) - Translating to approximately $500 additional income per person annually.[54]

finding under section 706. Rather, we intend for it to serve as a guidepost for evaluating our efforts to encourage deployment." 2024 Report at para. 47. Observing the rapid growth in demand for broadband capabilities and increased usage for telework, precision ag, telehealth, education, and other needs, NTCA suggests that long-term goals could be defined by a data-driven, incremental approach. Rather than setting static targets, current urban deployment standards could be taken as a baseline and scaled upward annually or bi-annually using a formula that incorporates historical demand growth patterns. This approach balances ambitious growth targets with realistic market expectations, ensuring long-term objectives that are achievable as well as responsive to (and reflective of) actual demand trends.

[53] NOI at para. 10.

[54] Weinstein, A., Erouart, M., Dewbury, A., "Beyond Connectivity: The Role of Broadband in Rural Economic Resilience and Growth," Center on Rural Innovation (2024) (https://ruralinnovation.us/resources/reports/report-the-role-of-broadband-in-rural-economic-growth-and-resilience/) (visited Sep. 2, 2025) (Weinstein, *et al.*).

These data demonstrate clearly the role of high-capacity, low-latency, scalable, and secure broadband as a catalyst for economic resilience in rural spaces. Invoking the admonition of Michelangelo, NTCA therefore urges the Commission to avoid setting modest targets that will achieve only modest connectivity – leaving rural (and indeed all) Americans without the connectivity necessary to compete in today's global market.

E. PROPER DEFINITIONS OF "RURAL" AND "URBAN" WILL FACILITATE EFFECTIVE RURAL DEPLOYMENT POLICY.

The Commission seeks comment on identifying census blocks as "being urban or rural using the 2010 and 2020 Urban Areas as defined by the U.S. Census Bureau," asking "whether this is the appropriate classification of urban and rural areas for the purpose of evaluating access to advanced telecommunications capability?"[55] NTCA submits that definition of rural - or, more specifically, the multiple definitions of rural across various Federal agencies - is one that confounds policy making.

For example, the Economic Research Service (ERS) of the USDA invokes population thresholds but also considers whether “outlying counties” are “economically tied to the central counties as measured by labor-force commuting,” among other criteria.[56] In comparison, the U.S. Department of Health and Human Services (HHS) explains that while the Census Bureau, Office

[55] NOI at para. 23.

[56] "Rural Classifications – What is Rural?," Economic Research Service, U.S. Department of Agriculture (Jan. 8, 2025) (https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural) (visited Sep. 3, 2025).

of Management and Budget (OMB), and ERS "describe geographic areas for various purposes," the HHS Health Resources Service Administration "form[s] our own rural definition."[57]

In 2021, the U.S. Office of Management and Budget proposed to increase the minimum population of metropolitan statistical areas from 50,000 to 100,000. NTCA advised against the change, warning it could risk mistaking stable conditions in high-population places with less stable conditions in smaller places.[58] The aggregation of smaller, less-populated areas with larger, economically prosperous regions can give a misleading impression of uniform success across all segments of the now-combined rural and urban space, potentially obscuring distinct challenges faced by the smaller community. This can result in diminished targeted interventions essential for supporting services in the otherwise underserved spaces.

Population density is the most significant factor determining deployment costs. While materials and labor costs vary geographically, these variations are not substantial. In contrast, the number of locations per linear mile has the greatest impact on project cost. The overall cost for mainline construction varies significantly across the United States depending on soil type, pole access, existing utilities, contractor availability, and environmental considerations. NTCA inquiries among its members, who collectively provide service in 47 states, reveal that

[57] "How We Define Rural," Health Services Resource Administration, U.S. Department of Health and Human Services (https://www.hrsa.gov/rural-health/about-us/what-is-rural) (visited Sep. 3, 2025).

[58] *In re: Recommendation From the Metropolitan and Micropolitan Statistical Area Standards Review Committee to the Office of Management and Budget Concerning Changes to the 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas,* 86 Fed. Reg. 5263, Letter from Joshua Seidemann, VP Policy, NTCA–The Rural Broadband Association, to Executive Office of the President, U.S. Office of Management and Budget (Mar. 19, 2021) (https://www.ntca.org/sites/default/files/federal-filing/2021-03/03.17.21%20OMB.pdf) (visited Sep. 3, 2025).

underground fiber deployment can vary from $20,000 to $300,000 per mile. A 2022 study found that rural mainline construction costs can start at $20,000 per mile (including all labor, materials, permitting, and engineering), but various factors can drive costs substantially higher. One study determined the average cost for mainline construction to be approximately $48,000 per mile for rural areas engineered for the RDOF auction[59]

In this vein, the Census Bureau recalibration of rural to include areas with larger population thresholds could dilute solutions intended to serve rural spaces by lumping high-need rural spaces with areas that by dint of the new definition are doing quite well. In fact, after recent changes to the Census Bureau's definitions for rural following the 2020 Census (including population and "jump distance"[60] criteria), 1,140 areas with a total population of approximately 4.2 million that were previously classified as urban are now defined as "rural."[61] Accordingly, and noting the maxim of "If you've seen one rural place, you've seen one rural place," NTCA recommends the Commission to take a "trust but verify" approach. This may include, for example, analyzing data on a study area or company basis to ensure that the Commission's understanding of the data truly reflects conditions in low-population density rural spaces.

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[59] Larry D. Thompson, PE, and Cole Donahue, "Cost of Bringing Broadband to All," Vantage Point Solutions (Minot, SD) (Aug. 1, 2022) (https://www.fcc.gov/ecfs/document/108012327916993/2) (visited Sep. 3, 2025). Adjusted for inflation, those costs would now be $22,077 and $52, 984, respectively.

[60] "Jump distance" is the road distance between high-density urban areas that are surrounded by rural spaces. "Nation's Urban and Rural Populations Shift Following 2020 Census," U.S. Census Bureau, Press Release No. CB22-CN.25 (Dec. 29, 2022) (https://www.census.gov/newsroom/press-releases/2022/urban-rural-populations.html#:~:text=As%20a%20result%20of%20these,classified%20as%20rural%20in%202010.) (visited Sep. 8, 2025).

[61] *Id.*

F. FIXED AND MOBILE SERVICES REMAIN COMPLEMENTARY AND ARE NOT SUBSTITUTES.

In its Section 706 inquiries, the Commission has found that fixed and mobile broadband services are complementary to, rather than substitutes for, each other. [62] By way of example, fiber broadband platforms offer robust security, stable connections, and capacity that can be expanded by adding electronics to those networks. Mobile communications, in comparison, offer users unprecedented "access anywhere" and play an integral role in revolutionary IoT (internet of things) transformations in agriculture, healthcare, public safety, and transportation. From a consumer perspective, and as the Commission has properly observed, they are complementary - *i.e.,* they are services that are used together, rather than in place of each other. As the Commission noted previously, "[m]any households continue to subscribe to both fixed and mobile broadband service."[63] This finding confirms that customers recognize the distinct use cases for each service and will subscribe to both when mobile and fixed services are available.

Complementary demand for fixed and mobile services can also be viewed within the context for which subscribers use the respective services. "On the go" applications such as mobile agriculture or certain telehealth applications demand mobile connectivity, while growing telework opportunities can be expected to drive demand for fixed services that can support worker ability at a home or other remote office. These constructs are especially relevant in rural

[62] *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*: *Fourteenth Broadband Deployment Report*, Docket No. 20-269, FCC 21-18, at para. 10 (2021), ("Despite both services' meeting the definition of advanced telecommunications capability, we find, consistent with the Commission's findings in past reports, that fixed and mobile services are not full substitutes.").

[63] *Id*.

service areas, where "work anywhere, from anywhere" enables diverse workforces to take advantage of rural amenities (including quality of life) while building local tax bases and economic resilience. A peer-reviewed study found that rural communities with higher broadband adoption rates experience more business startups and higher levels of entrepreneurship, along with 44% higher growth in GDP compared to communities with lower broadband usage rates. The study, which focused its case studies on rural areas with fiber deployments, also found higher levels of self-employment and higher per-capita income growth.[64]

In consumer theory, a substitute service is one that can be used in place of another with little or no noticeable difference. But, there are differences between certain fixed and mobile services. Spectrum-based services may adjust speeds in their wireless services in response to data usage or network congestion.[65] Satellite and fixed wireless services are also susceptible to interference from weather, disruptions to "line of sight" propagation, atmospheric conditions, and other factors that can disrupt wireless and satellite signals.[66] In contrast, wired connectivity

[64] See, Weinstein, *et al., supra* n.54.

[65] By way of example, Verizon restricts unlimited data to on-device usage. If data caps on mobile hotspot usage are exceeded, mobile hotspot speeds are reduced for the remained of the monthly billing cycle. *See,* "Important Plan Information: Unlimited Plans for Smartphones," Verizon (https://www.verizon.com/support/important-plan-information/#:~:text=Unlimited%20Plus%20plan:%20Unlimited%20data,of%20your%20monthly%20billing%20cycle) (visited Sep. 3, 2025). AT&T may slow speed if users exceed data limits in a billing period or if its network is "busy." *See,* "Network Demand and Data Use," AT&T (https://www.att.com/support/how-to/wireless/data-usage) (visited Sep. 3, 2025).

[66] *See, i.e.,* Jeff Fraleigh, "Fiber vs. Satellite Internet: Why Fiber Optics Lead the Future of High-Speed Connectivity," ETI Software (Apr. 24, 2024) (https://etisoftware.com/resources/blog/fiber-vs-satellite-why-fiber-optics-lead-the-future-of-high-speed-connectivity/#:~:text=Unlike%20satellite%20internet%2C%20which%20can,%2C%20high%2Dspeed%20internet%20access) (visited Sep. 3, 2025).

also offers superior security over wireless services;[67] a Black Hat 2020 experiment intercepted signals from 18 satellites from a single fixed location.[68] Substitution should require a more detailed qualitative analysis than, "Is it there?" and instead inquire as to whether consumers perceive equivalent capabilities and value when faced with a choice between the alternatives. While the differences between fixed and mobile do not discount the *relevance* of the respective services to consumers in certain cases and in fact *support* subscribers' use of them, they are not "substitutes" as defined in consumer theory principles.

As explained above, service capability and its ability to support applications that are essentially the *raison d'etre* of deployment is a key component in determining whether the nation is "on track" to meet aspirational goals. The Commission should retain its rational conclusion that fixed and mobile services should be considered complementary.

III. CONCLUSION

The Commission's Section 706 assessment should adopt a forward-looking approach that evaluates whether current infrastructure can meet both present and reasonably anticipated future demands. The standard of "advanced telecommunications capability" must be interpreted as evolving services that adapt to growing market needs for telework, telehealth, online education, entertainment and e-commerce, and AI applications that require higher-capacity broadband.

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[67] *See, i.e.,* Okeyo, O. J., "A Comprehensive Systematic Review of Privacy and Security Issues in Satellite Networks," GSC Advanced Research and Reviews, at 354-356 (2024) (https://gsconlinepress.com/journals/gscarr/sites/default/files/GSCARR-2024-0267.pdf) (visited Sep. 3, 2025).

[68] *See,* Anthony Spadafora, "Hacking Satellite Internet Connections is a Lot Easier than You'd Think," TechRadar Pro (Sep. 12, 2020) (https://www.techradar.com/news/hacking-satellite-internet-connections-is-a-lot-easier-than-youd-think) (visited Sep. 3, 2025).

Assessments of current deployment progress must envision rapidly advancing consumer demand rather than static minimums. As the Commission engages this inquiry, it should ensure that broad rural definitions do not dilute targeted rural broadband policies. Moreover, fixed and mobile broadband services remain complementary rather than substitutable, as each supports distinct use cases that combine to fuel economic growth and digital participation in rural communities.

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APPENDIX

A Five-Year Look at NTCA Broadband Deployment and Subscription Rate Data, 2020-2024

Executive Summary

NTCA has conducted a Broadband/Internet Availability Survey for more than 20 years.[*] A comparison of 2020 to 2024 data reveals astounding increases in deployment of advanced services and remarkable evidence of customer embracement of new advanced technologies. At the same time, NTCA members are increasing middle mile capacity while decreasing per-gigabyte costs, although total middle mile costs continue to increase as overall demand grows. These data reveal significant improvements in both broadband deployment and customer adoption of higher-speed services across rural America.

Technology Deployment

Fiber to the Premises/Home (Primary Technology)

- 2020: 69.9% of serviceable locations served by fiber
- 2024: 85.8% of serviceable locations served by fiber
- *Change: +15.9 percentage points (+22.7% relative increase)*

Copper Wire Services

- 2020: 21.2% of serviceable locations served by copper
- 2024: 12.9% of serviceable locations served by copper
- *Change: -8.3 percentage points (-39.2% relative decrease)*

[*] The NTCA Broadband/Internet Availability survey reports can be accessed at https://www.ntca.org/survey-reports (visited Sep. 3, 2025). For reports older than 2020, please contact NTCA.

Broadband Availability by Speed Tier

Downstream Speed Availability (What customers CAN receive)

≥1 Gig Service Availability

- 2020: 45.1% of customers could receive ≥1 Gig
- 2024: 76.4% of customers can receive ≥1 Gig
- *Change: +31.3 percentage points (+69.4% relative increase)*

≥100 Mbps but <1 Gig Availability

- 2020: 22.7% of customers could receive this tier
- 2024: 12.2% of customers can receive this tier
- Change: -10.5 percentage points (-46.3% relative decrease)

≥25 Mbps but <100 Mbps Availability

- 2020: 12.6% of customers could receive this tier
- 2024: 5.4% of customers can receive this tier
- Change: -7.2 percentage points (-57.1% relative decrease)

≥10 Mbps but <25 Mbps Availability

- 2020: 12.1% of customers could receive this tier
- 2024: 4.0% of customers can receive this tier
- Change: -8.1 percentage points (-66.9% relative decrease)

<10 Mbps Availability

- 2020: 7.6% of customers (combined lower tiers)
- 2024: 1.9% of customers
- Change: -5.7 percentage points (-75.0% relative decrease)

Summary: High-Speed Availability

- ≥100 Mbps Service Availability:
    - 2020: 67.8% of customers
    - 2024: 88.6% of customers
    - *Change: +20.8 percentage points (+30.7% relative increase)*
- ≥25 Mbps Service Availability:
    - 2020: 80.4% of customers
    - 2024: 94.0% of customers
    - *Change: +13.6 percentage points (+16.9% relative increase)*

Customer Subscription Patterns (What customers ACTUALLY subscribe to)

≥1 Gig Subscriptions

- 2020: 7.9% of customers subscribed
- 2024: 12.0% of customers subscribe
- Change: +4.1 percentage points (+51.9% relative increase)

≥100 Mbps but <1 Gig Subscriptions

- 2020: 20.2% of customers subscribed
- 2024: 55.3% of customers subscribe
- Change: +35.1 percentage points (+173.8% relative increase)

≥25 Mbps but <100 Mbps Subscriptions

- 2020: 35.8% of customers subscribed
- 2024: 22.6% of customers subscribe
- Change: -13.2 percentage points (-36.9% relative decrease)

≥10 Mbps but <25 Mbps Subscriptions

- 2020: 21.3% of customers subscribed
- 2024: 7.1% of customers subscribe
- Change: -14.2 percentage points (-66.7% relative decrease)

<10 Mbps Subscriptions

- 2020: 14.8% of customers (combined lower tiers)
- 2024: 3.1% of customers
- Change: -11.7 percentage points (-79.1% relative decrease)

Summary: High-Speed Subscriptions

- ≥100 Mbps Subscriptions:
    - 2020: 28.1% of customers
    - 2024: 67.3% of customers
    - *Change: +39.2 percentage points (+139.5% relative increase)*
- ≥25 Mbps Subscriptions:
    - 2020: 63.9% of customers
    - 2024: 89.9% of customers
    - *Change: +26.0 percentage points (+40.7% relative increase)*

Upstream Service Improvements

≥100 Mbps Upstream Availability

- 2020: 68.6% of customers could receive
- 2024: 84.9% of customers can receive
- Change: +16.3 percentage points (+23.8% relative increase)

≥3 Mbps Upstream Availability

- 2020: 83.8% of customers could receive
- 2024: 96.3% of customers can receive (calculated from <3 Mbps data)
- Change: +12.5 percentage points (+14.9% relative increase)

Middle Mile Infrastructure

Bandwidth Capacity

- 2020: Average of 38 GB subscribed
- 2024: Average of 118 GB subscribed
- *Change: +80 GB (+210.5% increase)*

Key Findings

Deployment Success

The data shows remarkable progress in fiber deployment, with rural providers increasing fiber-to-the-premises coverage by nearly 16 percentage points while simultaneously reducing copper-dependent services by over 8 percentage points.

Speed Migration

There is a clear migration pattern toward higher speeds:

- Gigabit availability increased by over 31 percentage points
- 100+ Mbps availability increased by over 20 percentage points
- Customers are actively adopting these higher speeds, with 100+ Mbps subscriptions increasing by 39 percentage points

Infrastructure Efficiency

Middle mile continues to drive costs: while providers have seen per-gigabyte costs drop by nearly 60%, providers are tripling their bandwidth capacity. efficiency.

Progressive Market

The subscription patterns suggest a progressive broadband market in rural areas, with customers increasingly choosing higher-speed tiers as they become available, moving away from legacy speed offerings.