

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

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

**COMMENTS OF THE FIBER BROADBAND ASSOCIATION ON
THE THIRTEENTH SECTION 706 REPORT NOTICE OF INQUIRY**

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INTRODUCTION & SUMMARY

The Fiber Broadband Association (“Fiber Broadband” or “Association”)¹ hereby submits comments in response to the Federal Communications Commission’s (the “Commission’s”) Thirteenth Section 706 Report Notice of Inquiry (“NOI”) in the above-captioned proceeding.² In this inquiry, the Commission seeks to start “afresh” its determination as to the availability of advanced telecommunications capability.³ The Association believes the Commission should use this opportunity to reassess how it measures such availability to reflect that consumers increasingly are focusing on broadband experience instead of just speed and that consumers

¹ Fiber Broadband was formerly known as the Fiber to the Home Council Americas (the “FTTH Council”). The Association’s mission is to accelerate deployment of all-fiber access networks by demonstrating how fiber-enabled applications and solutions create value for service providers and their customers, promote economic development, and enhance quality of life. The Association’s members represent all areas of the broadband access industry, including telecommunications, computing, networking, system integration, engineering, and content-provider companies, as well as traditional service providers, utilities, and municipalities. As of today, Fiber Broadband has more than 250 entities as members. A complete list of Fiber Broadband members can be found on the organization’s website: <https://www.fiberbroadband.org/>.

² *See Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, Thirteenth Section 706 Report Notice of Inquiry, FCC 17-109 (rel. Aug. 8, 2017).

³ *See id.*, para. 2.

understand that all-fiber networks are essential to providing a superior experience. As a result, providers are ratcheting up their investment in all-fiber networks to deliver a superior broadband experience and are touting this capability to keep current customers and attract new ones.

Accordingly, the Commission should reflect how the market has evolved and measure advanced telecommunications capability by examining whether consumers have access to all-fiber networks. The Commission should then, based on this “all-fiber” metric, address barriers to and gaps in all-fiber deployments.

I. IN DETERMINING THE AVAILABILITY OF ADVANCED TELECOMMUNICATIONS CAPABILITY, THE COMMISSION SHOULD FOLLOW THE MARKET AND BASE SUCH A DETERMINATION ON THE INDUSTRY’S ACCELERATED DEPLOYMENT OF ALL-FIBER NETWORKS IN RESPONSE TO CONSUMER DEMANDS FOR A SUPERIOR BROADBAND EXPERIENCE

The Commission correctly acknowledged in the NOI that communications providers, both fixed and mobile, are evolving to higher performance networks.⁴ For fixed providers, these are increasingly all-fiber networks, and even for mobile providers, cell sites increasingly are connected to all-fiber networks. In fact, after years of moving relatively deliberately to upgrade their networks, fixed and mobile providers across the U.S. are rapidly investing vast amounts of capital to build integrated fixed-wireless networks based on all-fiber connections. This not only reflects the ever-increasing demand by consumers for a superior experience from traditional broadband service,⁵ but an industry-wide consensus that these networks will need to support

⁴ *Id.*

⁵ See Michael Render, RVA LLC, “North American FTTH: The Latest Research” (presentation at 2016 Fiber Connect, Nov. 27, 2016) (finding that each person averages 5 hours online at home per day; there are 5.5 reported online devices in the home (plus smart appliances that are starting to gain traction); second screens are used 28 percent of the time when using the first screen for TV; and those under age 35 get about half of their

enormous data flows as the Internet of Things (“IoT”) and other innovative devices get connected.⁶ Networks with fiber end-points (*e.g.*, homes, commercial buildings, community institutions, wireless sites, IoT sensors) have a wide array of applications, provide virtually unlimited, symmetrical bandwidth to consumers, and are readily scalable to higher speeds simply by upgrading modulating electronics.⁷ Additionally, all-fiber networks do and increasingly will facilitate consumers’ increasing reliance on Wi-Fi and eventually 5G to engage with mobile applications and services, such as real-time video.⁸ Therefore, to fulfill the mandate set forth in

video content online (two-thirds among MDU residents under age 35) (“RVA November 2016 Data”).

Even as the demand for high-speed, bandwidth-intensive services increases, the cost to consumers for fiber-based services is decreasing. Based on SNL Kagan and other third-party data, from 2011-2017, prices for broadband Internet access service declined in every speed tier, from a reduction of 14 percent for lower speed services (below 10 Mbps) to a reduction of 57 percent for higher speed services (between 100 Mbps and 1 Gbps). *See* Comments of the Fiber Broadband Association on the Notice of Proposed Rulemaking, WC Docket No. 17-108, at 10 (filed July 17, 2017) (“Fiber Broadband Restoring Internet Freedom Comments”).

⁶ In February 2017, analyst firm Gartner projected that globally, the number of connected “things” will surpass 20 billion in the next three years. *See* “Gartner Says 8.4 Billion Connected ‘Things’ Will Be in Use in 2017, Up 31 Percent from 2016,” (Feb. 7, 2017) *available at* <http://www.gartner.com/newsroom/id/3598917>.

⁷ The Association recognizes that other transmission facilities, such as hybrid fiber-coax, also enable high-speed broadband service. However, as evidenced by recent announcements by Comcast and others (*see* discussion *infra*), even cable operators understand that the physical transmission medium of coaxial cable will be replaced by fiber because of its superior performance and operational characteristics and are accelerating their deployment of all-fiber infrastructure.

⁸ The Commission has noted that 80 percent of “wireless” use is Wi-Fi offload, and developments in wireless networks will depend on the availability of fiber backhaul. *See Lifeline and Link Up Reform and Modernization, Telecommunications Carriers Eligible for Universal Service Support, Connect America Fund*, WC Docket Nos. 11-42, 09-197, 10-90, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, Second Report and Order, Memorandum Opinion and Order, FCC 15-71, ¶ 45 & n.134 (rel. June 22, 2015).

Section 706, the Commission should take its direction from the market and assess the availability of advanced telecommunications capability on the presence of “all-fiber” networks.

By contrast, the speed metrics against which the Commission proposes to continue to evaluate the availability of advanced telecommunications services pursuant to Section 706⁹ are increasingly irrelevant for consumers and providers, and they certainly do not provide the basis for the Commission having a long-term vision for promoting deployment of advanced telecommunications services across the U.S. The industry is demonstrating that “technology counts,” and consumers of all stripes and their communities agree.¹⁰ Following this market reality will enable the Commission to use its Section 706 authority to address the barriers and gaps in all-fiber deployments.¹¹

II. THERE IS AMPLE MARKET EVIDENCE INDICATING THAT ALL-FIBER CONNECTIVITY IS ESSENTIAL FOR ALL NETWORKS

There is a rapidly growing consensus in the communications market that all-fiber networks need to be at the root of investment, innovation, and deployment, even if the network “tail” is wireless. According to research conducted for the Association (then, the FTTH Council) by market research firm RVA, LLC, in 2016, the growth rate for homes marketed with fiber to the home (“FTTH”) services rose by approximately 16 percent, and approximately 30.4 million

⁹ See NOI, paras. 12-22.

¹⁰ According to 2017 consumer market research data conducted for Fiber Broadband, all-fiber users are far more satisfied than cable modem and DSL users in all aspects, including reliability, consistency, and speed, even when the purported service speeds between fiber and other technologies were identical. See Michael Render, “2017 State of Broadband Market Research Update” (presentation at FiberConnect, June 2017).

¹¹ Fiber Broadband acknowledges that it takes time to build all-fiber networks and that for the most remote areas, the technology may not be economical; however, by having an “all-fiber” vision, the Commission will have a lodestar to pull its policies forward.

homes in the U.S. were passed by fiber.¹² Providers also continue to expand their fiber footprints for commercial services, which now cover about half of the buildings in the U.S.,¹³ and to support wireless backhaul, most of which will soon have fiber connections.¹⁴

The Commission noted in the NOI that many large incumbents, cable companies, and new entrants have recently announced or commenced the deployment of networks that can support gigabit-speed connections.¹⁵ To be clear, nearly all of these efforts involve deployment or expansion of all-fiber infrastructure. Regional and rural providers of broadband and other services also remain committed to adopting fiber-forward strategies.¹⁶ Finally, States and local

¹² See RVA November 2016 Data.

Available data also shows that U.S. penetration and adoption of higher-speed services compares favorably with developed countries, especially when normalized for population density. See *Fiber Broadband Restoring Internet Freedom* Comments at 14.

¹³ According to Vertical Systems Group, by the end of 2016, just under half of the commercial multi-tenant and company-owned buildings in the U.S. with twenty or more employees were fiber-lit. See “U.S. Business Fiber Gap Drops to Half,” Vertical Systems Group (Apr. 19, 2017) (subscription required). Additionally, eleven wholesale and retail fiber providers had 10,000 or more on-net fiber lit commercial buildings in the U.S., and another 17 providers offered lit fiber connections to between 2,000 and 9,999 U.S. commercial buildings. “U.S. Fiber Lit Buildings LEADERBOARD,” Vertical Systems Group (Aug. 2, 2017) available at <https://www.verticalsystems.com/vsglb/u-s-fiber-lit-buildings-leaderboard/>.

¹⁴ IHS Markit projects that by 2020, nearly 50 percent of all global mobile backhaul will be supported by fiber connections. See Dan Meyer, “5G and LTE-A set to power mobile backhaul market out of current doldrums,” RCRWireless (Nov. 1, 2016) available at <https://www.rcrwireless.com/20161101/carriers/5g-lte-set-power-mobile-backhaul-market-current-doldrums-tag2>.

¹⁵ NOI, para. 8, fn. 16-23.

¹⁶ In a survey of 172 rural broadband providers, NTCA found that 82 percent had developed long-term fiber deployment strategies (up from 74 percent in 2015), 31 percent of respondents already completed fiber deployments to all customers, and 66 percent plan to be able to provide FTTH networks to half or more of their customers by the end of 2019. See NTCA 2016 Broadband/Internet Availability Survey Report (July 2017), available at <https://www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2016ntcabroadbandsurveyreport.pdf>.

communities also have recognized the importance of all-fiber connectivity to power innovation and economic development.¹⁷ The attached Appendix provides numerous examples of recent all-fiber deployment efforts by these various stakeholders. The time has come for the Commission to accept the market reality that all-fiber networks will be relied upon by virtually all providers to support advanced telecommunications capability and then use this as the basis for exercising its Section 706 authority to address barriers to and gaps in all-fiber deployments.

III. THE COMMISSION SHOULD, AS PART OF ITS ONGOING EFFORTS TO FULFILL ITS MANDATE UNDER SECTION 706, TAKE STEPS TO ENABLE, ENCOURAGE, AND, WHERE NECESSARY, ENSURE THE DEPLOYMENT OF ALL-FIBER NETWORKS

As noted in the NOI, “Section 706 directs the Commission to use ‘price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating measures that remove barriers to infrastructure investment’ to encourage the deployment of advanced telecommunications capability on a reasonable and timely basis.”¹⁸ As explained in these comments, the market has demonstrated that all-fiber networks are essential for the availability of advanced telecommunications services, including broadband. Thus, as the Commission continues its work pursuant to Section 706, as well as provisions of the Communications Act, it should adopt policies that enable, encourage, and, where necessary, ensure all-fiber deployment, and in particular should address the following issues: barriers to entry, rural deployments, competition, and excessive regulation.

¹⁷ See Jamie McGee, “Chattanooga Mayor: Gigabit speed internet helped revive city,” *The Tennessean* (June 14, 2016), *available at* <http://www.tennessean.com/story/money/2016/06/14/chattanooga-mayor-gigabit-speed-internet-helped-revive-city/85843196/>.

¹⁸ NOI, para. 46.

Barriers to Entry. The cornerstone of the Commission’s efforts to promote broadband availability are the proceedings commenced earlier this year to remove regulatory barriers to wireline and wireless network investment and deployment.¹⁹ Fiber Broadband noted in its comments in response to the Wireline Infrastructure NPRM that there are two key barriers to all-fiber deployment that the Commission should address. First, the Commission should adopt reforms that will improve efficiency by addressing practices of many pole owners and existing attachers that delay and increase the cost of pole access. In particular, a “one-touch, make-ready” regime for pole attachments, a standard pole attachment application form, and a process to allow for electronic submission of applications would best “balance[] the legitimate needs and interests of new attachers, existing attachers, utilities, and the public” as the Commission seeks to facilitate broadband infrastructure investment and deployment.²⁰ Second, the Commission should utilize its authority under Section 253 of the Communications Act to promote all-fiber broadband deployment. Specifically, it should provide guidance as to what practices by state and local authorities “prohibit or have the effect of prohibiting” the provision of telecommunications

¹⁹ *Id.*, para. 47. See also *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84, Notice of Proposed Rulemaking, FCC 17-37 (rel. Apr. 21, 2017) (“Wireline Infrastructure NPRM”); *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment, et al.*, WT Docket No. 17-79, et al., Notice of Proposed Rulemaking, FCC 17-38 (rel. Apr. 21, 2017).

In addition to these rulemaking proceedings, the Commission announced the formation of the Broadband Deployment Advisory Committee (“BDAC”) in January 2017. The purpose of the BDAC is to “provide advice and recommendations to the Commission on how to accelerate the deployment of high-speed Internet access.” Public Notice, “FCC Announces the Establishment of the Broadband Deployment Advisory Committee and Solicits Nominations for Membership,” DA 17-110 (Jan. 31, 2017). Fiber Broadband submits that the BDAC’s recommendations, expected to be completed by November 2017, should factor into the Commission’s policies and rules aimed at reducing barriers to entry for broadband providers.

²⁰ Wireline Infrastructure NPRM, para. 1.

services in violation of Section 253(a), clarify the scope of state and local authority to manage public rights-of-way under Section 253(c), and make clear that entities that seek to access public rights-of-way may bring an action pursuant to Section 253(c) when state and local regulators' management activities or compensation requirements exceed the scope of Section 253(c). Such clarifications would address a number of the specific barriers to entry that service providers continue to face, including deployment moratoria, rights-of-way negotiation and approval process delays, excessive fees and costs, imposition of unreasonable conditions on public right-of-way access, bad faith negotiations, and lack of transparency in the state and local application process. More importantly, by setting forth clear “rules of the road,” the Commission will facilitate smooth rollouts of all-fiber broadband infrastructure and services across the nation going forward.

Deployment in Rural Areas. Chairman Pai has made clear his commitment to closing the digital divide, in part by “paying special attention to rural areas where the private-sector case for broadband deployment is much more difficult.”²¹ Fiber Broadband supports the Commission’s efforts to achieve this objective through the ongoing Connect America Fund (“CAF”) and Mobility Fund initiatives,²² and its plans to move forward “with a focus on assuring fiscal responsibility and making sure that these programs are leveraging—not displacing—private capital expenditures.”²³ Although the technology-neutral weighting mechanism would not be the Association’s preferred approach for the CAF Phase II program, it demonstrates that

²¹ See Remarks of FCC Commissioner Ajit Pai at the Brandery, “A Digital Empowerment Agenda” (Sept. 13, 2016).

²² See NOI, para. 46.

²³ See Remarks of Nicholas Degani at the University of Mississippi Tech Summit (Aug. 30, 2017).

the Commission recognizes that greater levels of broadband performance can produce greater benefits for consumers – indeed, the February 2017 CAF Phase II Order implicitly acknowledges that fiber-based services provide a unique value to consumers in terms of “faster speeds and lower latencies.”²⁴ Fiber Broadband therefore urges the Commission to ensure that consumers in less dense areas have access to the value that all-fiber networks provide to the maximum extent.

Competition for Broadband. There are numerous steps that the Commission can take to increase competition among all-fiber providers. First, as explained above, it should promote market entry by adopting the Association’s proposals to facilitate pole attachments and access to public rights-of-way. Second, to enhance broadband competition in multi-tenant environments (“MTEs”), the Commission should prohibit exclusive leaseback arrangements for inside wiring within MTEs except where providers can show they are not anti-competitive, and prohibit non-cost-based fee requirements and discriminatory revenue sharing arrangements between MTE owners and service providers.²⁵ It also should not prohibit states and municipalities from adopting laws enabling tenants to access providers of their choice. Third, to the extent authorized by the Communications Act, the Commission should support the efforts of municipalities to have the ability to determine how to ensure their communities have access to all-fiber networks, including through public-private partnerships.²⁶ Finally, consistent with the

²⁴ See *Connect America Fund, ETC Annual Reports and Certifications*, WC Docket Nos. 10-90, 14-58, Report and Order and Order on Reconsideration, 32 FCC Rcd 1624, para. 23 (2017).

²⁵ See Comments of the Fiber Broadband Association on the Notice of Inquiry, GN Docket No. 17-142 (filed July 24, 2017); Reply Comments of the Fiber Broadband Association on the Notice of Inquiry, GN Docket No. 17-142, (filed Aug. 22, 2017).

²⁶ See Appendix.

Department of Justice’s longstanding Merger Guidelines,²⁷ the Commission should review closely any proposed horizontal mergers or acquisitions that could have anti-competitive effects in the market for broadband service.

Excessive Regulation. There are at least two actions the Commission should take immediately to eliminate excessive regulation over broadband service. First, it should adopt an order in the *Restoring Internet Freedom* proceeding that restores “a light-touch regulatory framework for the Internet by classifying broadband Internet access service as an information service.”²⁸ As Fiber Broadband explained in its comments in the proceeding, if the Commission had conducted a market power analysis in 2015, it would not have any basis for finding that Internet service providers (“ISPs”) have market power – and even today, there is every indication that wireline ISPs continue to reduce prices and improve their service. Moreover, wireline and wireless ISPs are invading each other’s markets and, especially if the Commission undoes the telecommunications service classification adopted in 2015, have indicated they will invest many hundreds of billions of dollars over the next decade to build dense, mesh combined wireline/wireless networks through most markets in the U.S. In such an environment, the Commission should do no harm by intervening on the premise it can improve the market. Rather, it should seek to further expand supply by removing barriers to investment and otherwise encouraging entry.²⁹

²⁷ See “Horizontal Merger Guidelines,” Department of Justice and Federal Trade Commission (2010).

²⁸ NOI, para. 47. See also *Restoring Internet Freedom*, WC Docket No. 17-108, Notice of Proposed Rulemaking, FCC 17-60 (rel. May 23, 2017).

²⁹ See Fiber Broadband *Restoring Internet Freedom* Comments at 14-15.

The second action the Commission should take is to repeal the 2015 network change notification rule. This requirement, by imposing an unnecessary and costly process on incumbent local exchange carriers seeking to transition from copper to fiber networks, deters these carriers from investing in fiber infrastructure.³⁰

CONCLUSION

For the reasons explained herein, the Commission should acknowledge the market has endorsed “all-fiber” networks as the infrastructure over which consumers seek advanced telecommunications capability, and it should use this market reality as the basis upon which it exercises its Section 706 authority to address barriers to and gaps in consumers having access to this capability.

Respectfully Submitted,

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³⁰ See Comments of the Fiber Broadband Association on the Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment, WC Docket No. 17-84, at 9-12 (filed June 15, 2017). Indeed, as Chairman Pai observed when the Commission voted to adopt the Wireline Infrastructure NPRM, “[w]ithout rules that keep costs low and encourage deployment, [innovative providers] won’t get off the ground—and consumers will never benefit from the competition they’re trying to bring to the broadband marketplace.” Wireline Infrastructure NPRM, Statement of Chairman Ajit Pai.

Appendix – Examples of Recent All-Fiber Deployments

Incumbents, Cable Companies, and New Entrants

- **Verizon.** During a keynote address at Fiber Connect in June, Kyle Malady, Verizon’s Senior Vice President and Chief Network Officer for wireline said “fiber is basically the nervous system of the networks of the future.”¹ As evidence of this, Verizon has multiple initiatives already in place to expand its fiber footprint to support advanced wireline and wireless services. For example, as part of its One Fiber initiative, Verizon has entered into public-private partnerships with the cities of Boston and Sacramento through which the cities will facilitate Verizon’s deployment of fiber infrastructure in exchange for certain smart city/grid services that Verizon will provide.² Additionally, Verizon has recently purchased XO Communications,³ concluded transactions with Corning,⁴ and Prysmian,⁵ and announced another transaction with WideOpenWest,⁶ through which it will have acquired in total nearly 25 million miles of fiber, much of which will be used as backhaul support for 5G wireless services.

¹ See Bernie Arnason, “Verizon: We’re Doubling Down on Fiber Broadband, Just Don’t Call it Fios,” Telecompetitor (June 13, 2017) *available at* <http://www.telecompetitor.com/verizon-were-doubling-down-on-fiber-broadband-just-dont-call-it-fios/>.

² See Mari Silbey, “Verizon Takes ‘One Fiber’ to More Cities,” LightReading (June 22, 2017) *available at* <http://www.lightreading.com/smart-cities/verizon-takes-one-fiber-to-more-cities/d/d-id/733901>.

³ See Sean Buckley, “After delay, Verizon wraps \$1.8B XO acquisition, deepening metro fiber density in 45 markets,” FierceTelecom (Feb. 1, 2017) *available at* <http://www.fiercetelecom.com/telecom/after-delay-verizon-wraps-1-8b-xo-acquisition-deepens-metro-fiber-density-45-markets>.

⁴ See Corning News Release, “Verizon Agrees to \$1.05 Billion Three-Year Minimum Purchase Agreement with Corning for Next-Generation Optical Solutions,” (Apr. 18, 2017) *available at* <https://www.corning.com/worldwide/en/about-us/news-events/news-releases/2017/04/verizon-agrees-to-1-point-05-billion-dollar-three-year-minimum-purchase-agreement-with-corning-for-next-generation-optical-solutions.html>.

⁵ See Kelly Hill, “Verizon bulks up on fiber with \$300 million Prysmian deal,” RCRWireless News (May 9, 2017) *available at* <https://www.rcrwireless.com/20170508/wireless/verizon-bulks-up-on-fiber-with-300-million-prysmian-deal-tag6>.

⁶ See Sean Buckley, “Verizon confirms it is buying WideOpenWest’s Chicago fiber network for \$225M, augments backhaul network,” FierceTelecom (Aug. 2, 2017) *available at* <http://www.fiercetelecom.com/telecom/verizon-confirms-it-buying-wideopenwest-s-chicago-fiber-network-for-225m-augments-backhaul>.

- **AT&T.** Currently at the top of the Vertical Systems Group LEADERBOARD for lit fiber connections in commercial buildings,⁷ AT&T has long acknowledged the advantages of fiber,⁸ and has set a goal to serve 12.5 million locations with fiber-based broadband service by 2019. As of August 2017, AT&T has made service to approximately 5.5 million customers in 57 metro areas across the U.S., many of which fall outside AT&T's ILEC footprint.⁹
- **Comcast.** The major wireline provider launched its fiber-based Gigabit Pro service – which allows for speeds of up to 2 Gbps – in 2015.¹⁰ As of late 2016, Gigabit Pro was available in parts of approximately two dozen of Comcast's markets.¹¹
- **Altice USA.** The company reported that it expects to deploy its fiber network to reach 1 million newly constructed homes by the end of 2018.¹²

⁷ See “U.S. Fiber Lit Buildings LEADERBOARD,” Vertical Systems Group (Aug. 2, 2017) available at <https://www.verticalsystems.com/vsglb/u-s-fiber-lit-buildings-leaderboard/>. A significant portion of AT&T's Project Velocity IP was focused on expanding fiber to multi-tenant office buildings. See Sean Buckley, “AT&T's \$14B Project VIP: breaking out the business service, U-verse numbers,” FierceTelecom (Sept. 24, 2013) available at <http://www.fiercetelecom.com/special-report/at-t-s-14b-project-vip-breaking-out-business-service-u-verse-numbers>.

⁸ AT&T noted in a 2015 *ex parte* letter that “FTTP facilitates a better, more compelling set of products, and AT&T expects FTTP to have a longer economic lifespan than FTTN and other prior wireline network technologies.” See *Ex Parte* Letter from Maureen R. Jeffreys, Counsel to AT&T, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-90 (Apr. 21, 2015), available at <http://apps.fcc.gov/ecfs/document/view?id=60001044286>.

⁹ See AT&T, “Ultra-Fast Internet Speeds Available in 2 New Metro Areas and Expanding in 20 Current Metro Areas Powered by AT&T Fiber,” (Aug. 22, 2017) available at http://about.att.com/story/att_fiber_continues_to_expand.html. See also Alan Breznick, “AT&T spreads Fiber & G.fast Wings,” LightReading (Aug. 22, 2017) available at <http://www.lightreading.com/gigabit/gigabit-cities/atandt-spreads-fiber-and-gfast-wings/d/d-id/735645?>.

¹⁰ See Jon Brodtkin, “Comcast 2Gbps fiber available to 18M homes; gigabit cable coming soon,” ArsTechnica (Feb. 2, 2016) available at <https://arstechnica.com/information-technology/2016/02/comcast-2gbps-fiber-available-to-18m-homes-gigabit-cable-coming-soon/>.

¹¹ See Jon Brodtkin, “Comcast's gigabit cable will be in 15 cities by early 2017,” ArsTechnica (Nov. 2016) available at <https://arstechnica.com/information-technology/2016/11/comcasts-gigabit-cable-will-be-in-15-cities-by-early-2017/>.

¹² See Bevin Fletcher, “Altice's FTTH Build Out to Reach 1M New Homes by End of 2018,” CED Magazine (Aug. 15, 2017) available at

- **Cincinnati Bell.** The company announced that it had expanded its fiber network to pass 23,000 new addresses in the first half of 2017. As of August 2017, Cincinnati Bell's FTTH network covered more than 70 percent of the greater Cincinnati area.¹³
- **Hawaiian Telcom.** The company's fiber network has been deployed to approximately 202,000 homes, and nearly 7,000 businesses, 1,100 commercial buildings and 500 cell towers throughout Hawaii.¹⁴
- **Google Fiber.** Google Fiber is now available in ten cities across the U.S.¹⁵
- **Cox Communications.** The cable company's "Gigablast" FTTP platform is now available in all of its major markets.¹⁶

Regional and Rural Service Providers

- **i3 Broadband.** In August 2017, i3 Broadband announced plans to expand its fiber network in Urbana-Champaign, with plans for its fiber-optic gigabit network to reach 2,500 new homes this year.¹⁷

<https://www.cedmagazine.com/news/2017/08/altices-ftth-build-out-reach-1m-new-homes-end-2018>.

¹³ See Sean Buckley, "Cincinnati Bell passes additional 23K addresses with Fioptics, covers 70% of greater Cincinnati," FierceTelecom (Aug. 7, 2017) *available at* <http://www.fiercetelecom.com/telecom/cincinnati-bell-passes-additional-23k-addresses-fioptics-covers-70-greater-cincinnati>.

¹⁴ See Sean Buckley, "Hawaiian Telcom equips 200K homes with fiber-based broadband, wraps consumer fiber build," FierceTelecom (Mar. 14, 2017) *available at* <http://www.fiercetelecom.com/telecom/hawaiian-telcom-equips-200k-homes-fiber-based-broadband-wraps-consumer-fiber-build>.

¹⁵ See Sean Buckley, "Google Fiber finally starts taking orders in Raleigh, North Carolina," FierceTelecom (Feb. 2, 2017) *available at* <http://www.fiercetelecom.com/telecom/google-fiber-finally-starts-taking-orders-raleigh-n-c>.

¹⁶ See Jeff Baumgartner, "Cox Enters Next Phase of Gigabit Rollout," Broadcastingcable.com (July 28, 2017) *available at* <http://www.broadcastingcable.com/news/technology/cox-enters-next-phase-gigabit-rollout/167559>.

¹⁷ See Ben Zigterman, "I3 Broadband Expanding Fiber Network; Retail Store Open," The News-Gazette (Aug. 24, 2017), *available at* <http://www.news-gazette.com/news/local/2017-08-24/i3-broadband-expanding-fiber-network-retail-store-open.html>.

- **123Net.** In June 2017, 123Net commenced a \$15 million expansion of its fiber optic network in western Michigan.¹⁸
- **Independents Fiber Network.** In February 2017, Independents Fiber Network announced plans to expand its fiber network into Warren and Butler counties in Ohio. The additions amount to 240 added route miles totaling 3,551 fiber miles.¹⁹
- **Chariton Valley Telephone.** The Missouri-based provider announced earlier this year that it would invest \$50 million to install fiber infrastructure in its existing service territories and new areas.²⁰
- **Shentel.** By mid-2016, Shentel, which offers services in Virginia, West Virginia, and Maryland, had passed over 15,000 homes in its rural service footprint with FTTH.²¹

States and Local Communities

- **Chattanooga, TN.** In May 2017, the Tennessee Valley Authority announced plans to spend at least \$300 million over the next decade to upgrade the communications backbone of its network by installing 3,500 miles of new fiber optic lines across its seven-state region.²²

¹⁸ See Shandra Martinez, “123Net spending \$15M to expand West Michigan fiber network,” MLive (June 4, 2017), *available at* http://www.mlive.com/news/grand-rapids/index.ssf/2017/06/123net_spending_15m_investment.html.

¹⁹ See Kathy Reinsel, “Independents Fiber Network Expands into Ohio Warren and Butler Counties,” (Feb. 14, 2017), *available at* <http://www.ifnetwork.biz/news/independents-fiber-network-expands-ohio-warren-and-butler-counties>.

²⁰ See Sean Buckley, “Chariton Valley Telephone dedicates \$50M to deepen FTTH network reach,” FierceTelecom (June 30, 2017) *available at* <http://www.fiercetelecom.com/telecom/chariton-valley-telephone-dedicates-50-to-deepen-ftth-network-reach>.

²¹ See Sean Buckley, “Shentel passes 15K homes with FTTH, replaces outdated cable network infrastructure,” FierceTelecom (Sept. 6, 2016) *available at* <http://www.fiercetelecom.com/telecom/shentel-passes-15k-homes-ftth-replaces-outdated-cable-network-infrastructure>.

²² See Dave Flessner, “Tennessee Valley Authority to Invest \$300M Expanding Fiber Network,” GovTech (May 12, 2017), *available at* <http://www.govtech.com/dc/articles/Tennessee-Valley-Authority-to-Invest-300M-Expanding-Fiber-Network.html>.

- **Westminster, MD.** In 2015, Westminster, Maryland partnered with Ting, a Canadian FTTH provider, on a public-private partnership to deploy an all-fiber network to 10,000 homes and businesses in the community.²³
- **Centennial, CO.** In March 2016, the City Council of Centennial, Colorado voted to allocate \$5.7 million to implement its Fiber Master Plan in an effort to bring all-fiber networks to the city's more than 100,000 residents.²⁴
- **Multiple Rural Communities in MN.** Seventeen townships and ten cities in Minnesota collectively agreed to finance RS Fiber Cooperative, a \$45 million network to serve more than 6,000 households, farms, and other businesses in a 700+ square-mile area in rural Minnesota with both wireless and universal fiber-optic service.²⁵

²³ See Gigi Sohn, Counselor to the Chairman, Office of Chairman Tom Wheeler, Address at Westminster's Fiber Launch Party (June 26, 2015).

²⁴ See Alex DeWind, "Fiber Master Plan addresses technology needs and services," Centennial Citizen (Apr. 1, 2016), *available at* <http://centennialcitizen.net/stories/Fiber-Master-Plan-addresses-technology-needs-and-services,210658>.

²⁵ See Scott Carlson and Christopher Mitchell, "RS Fiber; Fertile Fields for New Rural Internet Cooperative," Institute for Local Self-Reliance and Next Century Cities (Apr. 2016) *available at* <https://ilsr.org/wp-content/uploads/downloads/2016/05/RS-Fiber-Report-2016.pdf>.