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

In the Matter of	)	
	)	
Modernizing the E-rate	)	WC Docket No. 13-184
Program for Schools and Libraries	)	
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REPLY COMMENTS OF THE FIBER TO THE HOME COUNCIL AMERICAS

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SUMMARY

The Fiber to the Home Council Americas ("FTTH Council" or the "Council") submits these reply comments in response to the Commission's Notice of Proposed Rulemaking to modernize the E-rate program.

Schools and libraries across the country are rapidly "shifting to digital" by incorporating an increasing number of innovative digital learning tools into school curricula and library services. These digital tools provide students and library patrons with basic education, access to information, modern digital collaboration tools, and other essential services necessary to compete in the global economy. As a result of this burgeoning demand, schools and libraries are finding that their broadband infrastructure is insufficient. The Commission has an opportunity in the E-rate modernization proceeding to address this gap by encouraging and supporting the deployment of ultra-high-speed all-fiber networks to schools and libraries.

All-fiber networks are the most capable, cost-effective and future-proof communications infrastructure, which can meet the needs of schools and libraries and achieve the goals of the E-rate Program and the ConnectED initiative. In effect, they are the bedrock technology for digital learning and can provide this capability for decades to come. Once deployed, their transmission capabilities can be readily enhanced by simply upgrading electronics or lighting additional fibers. Moreover, fiber networks offer significant positive externalities for surrounding neighborhoods by lowering the cost of deployment and promoting opportunities for continued digital learning at home. For these reasons, the Council submits that providing fiber connectivity to all schools and libraries will best achieve the goals of the E-rate modernization initiative.

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REPLY COMMENTS OF THE FIBER TO THE HOME COUNCIL AMERICAS

The Fiber to the Home Council Americas ("FTTH Council" or the "Council") respectfully submits these reply comments in response to the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rulemaking ("NPRM") to modernize the E-rate program for schools and libraries ("E-Rate").[1] The FTTH Council is a not-for-profit entity whose 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 FTTH Council's over 290 members,[2] which 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) have a substantial interest in the outcome of this proceeding. The Council supports the goal of the E-rate modernization proceeding to provide ultra-high-speed broadband connectivity to all schools and libraries through the deployment of all-fiber networks.

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[1] *See In the Matter of Modernizing the E-rate Program for Schools and Libraries*, WC Docket No. 13-184, Notice of Proposed Rulemaking, FCC 13-100 (July 23, 2013) ("NPRM").

[2] A complete list of FTTH Council members can be found on the organization's website: http://www.ftthcouncil.org.

As explained herein, because schools and libraries increasingly rely on bandwidth-intensive digital tools and services to serve students and patrons, there is a great and growing need for ultra-high-speed broadband capabilities. Yet, too few schools and libraries have all-fiber connectivity to meet these needs. In the E-rate modernization proceeding, the Commission can remedy this problem by encouraging and supporting the deployment of all-fiber networks, which are the most cost-effective and future-proof communications infrastructure that enable significantly faster and more scalable transmissions than other technologies. Moreover, fiber networks offer significant positive externalities for surrounding neighborhoods by lowering the cost of deployment and promoting opportunities for continued digital learning at home. For these reasons, the Council believes that all-fiber optic connectivity is essential to achieve the goals of the E-rate modernization initiative.

I. THERE IS A STRONG AND GROWING NEED FOR ULTRA-HIGH-SPEED BROADBAND CAPABILITIES IN OUR SCHOOLS AND LIBRARIES

Ultra-high-speed broadband capabilities are critical to meeting the goals of the E-rate program and the rapidly evolving demands of schools and libraries. Students and teachers increasingly are incorporating real-time, collaborative online experiences into school curricula, including "cutting-edge learning tools in the areas of science, technology, engineering and math (STEM) education."[3] Similarly, libraries have seen a dramatic rise in the use of digital technologies, as patrons use those services to gain job skills and access government services. Schools and libraries are already finding that available bandwidth does not meet current needs, and with the development of new applications—including distance learning software, 3-D printing, and software lending libraries—these needs will only become more acute. They require networks with ultra-high speed to keep up with this growing demand.

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[3] *See* NPRM, ¶ 3.

A. Schools and Libraries Are Increasingly Relying on Bandwidth-Intensive Digital Tools

In its NPRM, the Commission recognized that schools and libraries require bandwidth-intensive technologies to deliver services to students and library patrons.[4] Schools have increasingly incorporated into the everyday classroom experience digital learning tools, including interactive media, Internet-enabled devices, and digital textbooks. The State Educational Technology Directors Association ("SETDA") has identified a number of online learning tools and content that have characterized the "shift to digital," including video streaming, downloading content, digital textbooks, online assessment, and online learning for students and teachers.[5] Among these tools and services, perhaps the most used and most bandwidth intensive is video. A 2010 survey conducted by PBS and Grunwald Associates determined that 76% of teachers report that they stream or download video content into the classroom, up from 55% just three years earlier.[6] In its white paper filed in conjunction with this proceeding, Cisco explained the myriad ways that educators have begun to utilize video inside and outside the classroom:

> Video is increasingly being used to engage students, provide access to outside experts, and to connect students and teachers across geographic boundaries. . . . Video is used today to bring remote subject matter experts into the classroom, or to take students on a virtual field trip to a museum or research center, allowing students to learn about and experience different locations around the world. Video is also used for student tutoring and for students to connect with one another and their teachers.

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4 *See* NPRM, ¶¶ 3-4.

5 *See* Christine Fox et al., *The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs*, State Educational Technology Directors Association, at 10-15 (2012) ("Broadband Imperative Report"), *available at* http://www.setda.org/web/guest/broadbandimperative.

6 *See* Comments of the Benton Foundation, WC Docket No. 13-184, at 11 (Sept. 16, 2013) ("Benton Foundation Comments") (citing Grunwald Associates LLC, *Teachers Increasingly Rely on Media and Technology*, at 2 (2010), *available at* http://www-tc.pbs.org/about/media/about/cms_page_media/182/PBS-Grunwald-2011e.pdf).

> Teachers also use video conferencing for professional development, allowing them to attend remote lectures related to their fields of expertise, or to advances in technology in the classroom. The same video conferencing endpoint can also facilitate parent/teacher engagement.[7]

As a result of these and related technological developments, the Kansas Department of Education has indicated that its bandwidth needs have grown exponentially.[8] Indeed, as the need for high-definition and real-time video content grows, schools will require ever-greater bandwidth to meet the demands of students and to provide immersive experiences that retain students' attention and prepare them to compete in the global digital economy.

Libraries have also seen dramatic growth in the bandwidth needs of their patrons, both in terms of the number of individuals served and the types of services provided. In its NPRM, the Commission explained that "high-capacity broadband access provides patrons the ability to search for and apply for jobs; learn new skills; interact with federal, state, local, and Tribal government agencies; search for health-care and other crucial information; make well-informed purchasing decisions; engage in life-long learning; and stay in touch with friends and family."[9] These services are especially important for low income and elderly individuals, many of whom lack computer or Internet access at home and rely on fast and reliable broadband access at their local libraries. For example, the American Library Association ("ALA"), in its comments, cited a 2010 Institute of Museum and Library Services study finding that "30 million library users

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[7] "High-Speed Broadband in Every Classroom: The Promise of a Modernized E-Rate Program," Cisco, at 32 (Sept. 2013) ("Cisco White Paper").

[8] *See* Comments of the Kansas Department of Education, WC Docket No. 13-184, at 2 (Sept. 16, 2013) ("Kansas DOE Comments").

[9] NPRM, ¶ 4.

reported going to the library for employment-related activities in a 12-month period."[10] In addition, the ALA has found that "[v]irtually all libraries (92 percent) report staff help people understand and use government websites."[11] As a result of this increased demand, the ALA noted that "[o]ver the last 15 years the number of computers in libraries has doubled."[12]

In addition to providing basic access to information for many segments of the population, libraries are now offering next-generation services that place additional pressure on the limited bandwidth of their networks. For example, libraries have begun to promote innovation and entrepreneurship through "maker spaces" for 3-D printing and co-working facilities, where enterprising young people can collaborate and design new applications and services.[13] These next-generation services and facilities require high-capacity broadband capabilities that can keep up with evolving and ever-increasing demand for broadband.

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[10] *See* Comments of the American Library Association, WC Docket No. 13-184, at 7 (Sept. 16, 2013) ("ALA Comments") (citing Samantha Becker et al, *Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries*, Institute of Museum and Library Services (2010), *available at* http://impact.ischool.washington.edu/documents/OPP4ALL_FinalReport.pdf (last visited Nov. 5, 2013).

[11] ALA Comments at 8.

[12] *Id.* at 11.

[13] *Id.* at 8; *see also* Comments of the Schools, Health & Libraries Broadband Coalition, WC Docket No. 13-184, at 11 (Sept. 16, 2013) ("SHLB Comments"). For example, the Washington, D.C. Public Library recently opened a Digital Commons, which is an innovative library space that offers, among other services, 16 iMac computers, 60 PCs, a 3-D printer, a "Digital Bar to test-drive tablet computers," and a "Dream Lab collaborative space with smart boards and video conferencing capability." *See* DC Public Library: Digital Commons at MLK, *available at* http://dclibrary.org/digitalcommons (last visited Nov. 5, 2013). Other libraries, including the Chicago Public Library and the Carnegie Library of Pittsburgh, also provide patrons with tools "to produce rich, multi-media products using the latest technology tools while connecting these learning experiences directly back to school and careers." *See* ALA Comments at 7-8; NPRM ¶ 4. Indeed, the ALA noted that its patrons "are increasingly using cloud-based and interactive Web 2.0 services," which place added pressure on libraries' broadband networks. *See* ALA Comments at 11. Moreover, "[r]emote services such as distance education and distributed book groups or lawyer consulting services . . . depend on video conferencing and, in the future, telepresence systems," which are highly bandwidth intensive. *Id.* at 22.

B. Current Capacity Is Unable to Keep up with Bandwidth Demand

Because of their growing bandwidth needs, schools and libraries are finding that available capacity is insufficient. As Cisco explained, "[t]oday, 80 percent of schools and libraries believe their bandwidth does not meet their current needs,"[14] and "[i]n a few short years, every school in America will require connections of at least 1 Gigabit per second, and larger schools will require speeds faster than that."[15] And yet, EducationSuperHighway found that fewer than 1% of schools have the bandwidth today that will be necessary in 2017.[16] In addition, for those schools that have incorporated digital learning, recent surveys reveal that 78% of school teachers report bandwidth-related problems that have impaired the classroom learning experience.[17]

Libraries face a similar bandwidth crunch. The ALA noted that "the pressures on library technology infrastructure outpace [the] ability to meet community needs."[18] Specifically, "[t]he number of computers and computer users, as well as the proliferation of high-bandwidth applications, outstrips [libraries'] internet capacity."[19] Moreover, over "one-quarter of rural libraries reported in 2011 that they were at the maximum speed available in their community."[20] As such, it is critical that schools and libraries have access to ultra-high-speed broadband capabilities to meet future bandwidth demand.

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14 Cisco White Paper at 3; *see also* ALA Comments at 11 (citing 2010 E-Rate Program and Broadband Usage Survey: Report, DA-10-2414, at 2 (rel. Jan. 6, 2011), *available at* http://transition.fcc.gov/010511_Eratereport.pdf).

15 Cisco White Paper at 6.

16 *See* Comments of EducationSuperHighway, WC Docket No. 13-184, at 4 (Sept. 16, 2013) ("EducationSuperHighway Comments").

17 *See* Benton Foundation Comments at 11-12.

18 ALA Comments at 9.

19 *Id.*

20 *Id*. at 11.

II. ALL-FIBER NETWORKS ARE THE SOLUTION; THEY EMPLOY THE BEST TECHNOLOGY TO ADDRESS THE BANDWIDTH-GAP FACED BY SCHOOLS AND LIBRARIES

In the NPRM, the Commission noted the "strong evidence and growing consensus that E-rate needs to sharpen its focus and provide schools and libraries with high-capacity broadband connections."[21] To that end, the Commission sought comment on whether it should adopt the recommendations of SETDA, which proposed a target speed of 100 Mbps per 1,000 students and increasing to 1 Gbps per 1,000 students.[22] Moreover, the Commission sought comment on bandwidth targets for libraries, and whether "a target of 1 Gbps for all libraries by 2020 is an appropriate measure," as recommended by the Gates Foundation and the State Library of Kansas.[23]

To achieve these targets, the Commission asked whether "fiber connections [are] generally the most cost effective and future-proof way to deliver high-capacity broadband to community anchor institutions like schools and libraries[.]"[24] As evidenced by many commenters and as explained in more detail below, the answer is resoundingly yes. All-fiber networks are essential to meeting the needs of schools and libraries and furthering the broader goals of the E-rate Program. Moreover, fiber is superior to other available options because it is future-proof, scalable, and more cost-effective in the long term. It also provides positive collateral benefits for the broader community. Therefore, the Commission should ensure that schools and libraries have this fundamental – fiber – connectivity.

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21 *See* NPRM, ¶ 5

22 *Id.*, ¶ 23 (citing Broadband Imperative Report at 2).

23 *Id.*, ¶ 25 (citing Letter from Karen Archer Perry, Senior Program Officer, U.S. Libraries Program, Bill & Melinda Gates Foundation, to Ms. Marlene Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 et al., at 7-9 (Aug. 2, 2011)).

24 *Id.*, ¶ 67.

A. Commenters Agree that Fiber Is Essential to Meeting the Commission's Broadband Goals

Given the tremendous growth in bandwidth needs for schools and libraries, many commenters agreed that all-fiber networks are the answer, providing the most cost-effective and future-proof option to meet their broadband capacity needs now and well into the future. According to EducationSuperHighway, "[t]he only way to accommodate schools' and libraries' ever-growing need for bandwidth is to ensure that each school and library with more than 100 students/patrons has a fiber connection . . . ."[25] The LEAD Commission agreed, stating that "we need to enable districts to invest in fiber connections to their schools."[26] Similarly, the ALA noted that "for the great majority of libraries, fiber connectivity offers the best, long-term way to ensure that libraries will have access to adequate and scalable bandwidth."[27] The Kansas Department of Education echoed the comments of others, asserting that it "believe[s] fiber is the best way to provide the required levels of access."[28]

In a similar vein, Cisco argued that, "[i]f available and feasible, fiber media for the last mile and lateral connections is *always* preferred over other physical media types as it would provide the most flexibility for future growth."[29] As a result, "schools should pursue opportunities to use fiber when available for connections between buildings, to allow for practically unlimited bandwidth as needs increase over time."[30] Similarly, Internet2 concluded that the Commission should "generally promote support for scalable, flexible, and affordable

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25 EducationSuperHighway Comments at 7.

26 *E-Rate 2.0: Connecting Every Child to the Transformative Power of Technology: Hearing Before the S. Comm. on Commerce, Sci. and Transp.*, 113th Cong. 6 (2013) (statement of James G. Coulter, Co-Chair, LEAD Commission).

27 ALA Comments at 12.

28 Kansas DOE Comments at 3.

29 Cisco White Paper at 29 (emphasis added).

30 *Id.*

fiber infrastructure solutions."[31] Finally, the New America Foundation asserted that "fiber is certainly the most future-proof technology available when it comes to high-capacity broadband."[32]

B. Fiber Provides Unparalleled Advantages over Other Available Technologies

Simply put, fiber infrastructure provides the best possible medium to allow schools and libraries to meet the growing demand for bandwidth. Fiber is technologically superior to other transmission media, it is a better long-term investment for schools and libraries, and it will provide significant collateral benefits to surrounding communities.

1. Fiber Is Technologically Superior to Other Available Transmission Media

As explained in a recent ALA policy brief, "[f]rom a technical perspective, fiber optics is the most robust technology currently available."[33] Fiber has vastly greater performance capabilities and is more scalable, reliable, and secure than any other technology. In addition, fiber best meets the needs of schools and libraries for symmetrical transmissions. It is for these reasons that the ALA calls fiber the "technology of choice for the twenty-first century."[34] Let us elaborate.

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[31] *See* Comments of Internet2, WC Docket No. 13-184, at 15 (Sept. 16, 2013) ("Internet2 Comments").

[32] Comments of the New America Foundation's Open Technology Institute and Education Policy Program, WC Docket No. 13-184, at 4 (Sept. 16, 2013) ("New America Foundation Comments").

[33] John Windhausen, Jr. and Marijke Visser, *Fiber to the Library: How Public Libraries Can Benefit from Using Fiber Optics for their Broadband Internet Connection*, ALA Office for Information Technology Policy, Policy Brief No. 1, at 3-4 (Sept. 2009) ("Fiber to the Library"), *available at* http://www.ala.org/offices/sites/ala.org.offices/files/content/oitp/PDFs/fiber%20brief_%20published.pdf.

[34] ALA Comments at 12 (quoting Fiber to the Library at 4).

First, "in contrast to other technologies, such as digital subscriber line (DSL), cable modem, wireless, or satellite, fiber optics provides almost unlimited capacity."[35] Indeed, fiber has enormous transmission capabilities.[36] Optical fiber can transmit 15.5 terabits of data per second over a distance of 7,000 kilometers.[37] That means the entire iTunes catalog can be sent from the U.S. to Europe in less than 30 seconds.[38] Not surprisingly, fiber is the underlying technology for 100 Gbps Ethernet service and will enable speeds for this service to increase greatly over time.

Second, fiber is more scalable and readily upgradeable. Indeed, "[a]s long as sufficient fiber is installed initially, adding capacity to accommodate bandwidth growth can be a simple matter of either changing multiplexing equipment or lighting additional dark fibers."[39] In addition, fiber is scalable, and can scale to handle many times more than current volumes. A single fiber is capable of transmitting 250 million phone conversations every second.[40]

Third, fiber is light and easy to handle, yet rugged. An optical fiber is the size of a human hair. One mile of fiber weighs about 1/4th of a pound.[41] At the same time, every centimeter of fiber is strength tested at a minimum of 100,000 pounds per square inch. There also is no theoretical lifetime for fiber, with cables installed decades ago still in use today.

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35 *See* Fiber to the Library at 4.

36 *See id.* at 5. *See also*, Corning Cable Systems, *Understanding Fiber Optics and Local Area Networks*, at 1 (2006) ("Understanding Fiber Optics"), *available at* http://csmedia.corning.com/CableSystems%5CResource_Documents%5Cadditional_information_rl%5CLAN-737-EN.pdf ("The amount of information carried in two strands of optical fiber would require a copper cable four inches in diameter.").

37 *See* Corning Cable Systems, *Get the Facts on Optical Fiber!*, at 11 (2012) ("Fiber Facts Brochure"), *available at* http://media.corning.com/flash/opticalfiber/2012/corning_optical_fiber/Documentation/FIBER_MATTERS/flipbook/585324499/files/inc/585324499.pdf.

38 *Id.*

39 EducationSuperHighway Comments at 9-10.

40 Fiber Facts Brochure at 11.

41 *Id.*

Fourth, fiber is more reliable than other systems, allowing for transmission across long distances with minimal signal loss.[42] Indeed, while the first viable low-loss fiber had an attenuation of approximately 17 db/km; today's signal loss is just 0.17 db/km. Additionally, fiber needs less amplification than other transmission systems. Traditional optical fiber systems need repeaters only every sixty miles,[43] and with recent innovations, signals can go hundreds of miles before they need to be amplified or regenerated.

Fifth, fiber is more secure than other technologies. Fiber is difficult to tap or jam, since any attempt to tap into a fiber may cause the glass to break. Also, "the dielectric (non-conducting) nature of optical fiber makes it impossible to remotely detect the signal being transmitted within the cable."[44] In addition, the lower power levels used for optical signals increase the system sensitivity to any invasive power loss.[45]

Sixth, fiber provides high-quality transmissions. Because fiber is dielectric, it can be installed in areas where other technologies—such as copper and coaxial cable—would suffer electro-magnetic interference, including areas near utility lines and railroad tracks.[46]

Finally, fiber connectivity is superior because it easily provides symmetrical bandwidth. Providing equal upload and download speeds is critical to fully interactive, real-time video experiences and collaboration tools. These collaboration tools have the potential to empower students through distance learning opportunities, virtual field trips, and other experiences that are becoming more commonplace in the modern classroom. Similarly, as libraries begin to offer

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42 *See* Understanding Fiber Optics at 2.
43 *See* Fiber Facts Brochure at 11.
44 Understanding Fiber Optics at 2.
45 *See* Fiber Facts Brochure at 11.
46 *See* Understanding Fiber Optics at 2

innovative services such as software lending,[47] the need for symmetrical capacity will only increase. Additionally, with libraries continuing to transform into centers for innovation and entrepreneurship, symmetrical capacity will transform consumers into producers and facilitate incredible technological advancement.

2. Fiber Is a More Cost-Effective Long-Term Investment for Schools and Libraries

In addition to being technically superior to other available options, fiber is also a more cost-effective long-term investment for schools and libraries. Fiber optic cables are small and light weight, making installation in existing ducts and conduits simple and practical, saving space while saving costs.[48] Indeed, advancements over the past decade have enabled optical fiber to bend around tight corners without sacrificing performance. Fiber is also "green," since it does not generate excess heat while operating.[49] As a result, power loads – and, consequently, energy costs – can be reduced significantly.

In addition, EducationSuperHighway explained in its comments that fiber deployment has facilitated the Internet revolution "by enabling broadband providers to repeatedly, dramatically increase the amount of bandwidth they can deliver to a location with only modest incremental capital investments and little to no increase in ongoing operating costs."[50] Sunesys noted in its comments that "the ability to upgrade an existing fiber-based network from 1 Gbps to

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47 *See* Patrick Marshall, *Kansas City proposes gigabit-speed software lending library*, GCN (July 19, 2013), *available at* http://gcn.com/articles/2013/07/19/kansas-city-google-fiber-software-lending-library.aspx (last visited Nov. 5, 2013).

48 See Understanding Fiber Optics at 1.

49 *See* Fiber Facts Brochure at 11.

50 EducationSuperHighway Comments at 9.

10 Gbps would, today, only cost approximately 2-2.5 times more," which is "a ten-fold increase in connectivity for less than triple—and in some instances only double—the cost."[51]

Moreover, once installed, the maintenance costs of fiber networks are significantly less than other available options. For example, Verizon has estimated that the "difference in maintenance costs between a copper line and fiber line, expressed in a Net Present Value of all future gains, exceeds $200 per connection."[52] Similarly, the ALA argued that deploying a fiber network "can provide [a] library and school with significantly greater bandwidth at affordable costs for many years into the future."[53]

3. Fiber Will Benefit the Whole Community

Deploying fiber will promote positive spillover effects into the neighborhoods surrounding schools and libraries. Windstream correctly noted in its comments that "the deployment of fiber to schools and libraries can have significant collateral benefits—or 'halo effect'—decreasing the cost of broadband deployment to surrounding homes and businesses and thus facilitating the achievement of the Commission's broader universal service goals."[54] Similarly, the National Broadband Plan states that "once community anchors are connected to gigabit speeds, it would presumably become less expensive and more practical to get the same speeds to homes."[55]

By creating conditions whereby fiber optic networks can be expanded to surrounding neighborhoods cheaply and efficiently, the Commission will promote continued deployment of

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51 Comments of Sunesys, LLC, WC Docket No. 13-184, at 6 (Sept. 16, 2013).

52 New America Foundation Comments at 5-6 (citing Herman Wagter, *Fiber to the X: The Economics of Last-Mile Fiber* (Mar. 31, 2010), *available at* http://arstechnica.com/tech-policy/2010/03/fiber-its-not-all-created-equal/).

53 ALA Comments at 20.

54 Comments of Windstream Corporation, WC Docket No. 13-184, at 3 (Sept. 16, 2013).

55 *Connecting America: The National Broadband Plan*, Goal No. 4, at 10 (2010).

such networks, ensuring that students and library patrons have the same access to digital learning tools at home that they do in the library or at school. Indeed, in its 2012 *Broadband Imperative* report, SETDA recognized that "[h]ome access to broadband is arguably as important to the overall quality of the learning experience as access at school-and it is a key strategy in extending learning time."[56] As a result, by promoting more cost-effective and efficient fiber builds to surrounding neighborhoods, the E-rate program can achieve spillover effects that form an essential component of digital learning.

For all of these reasons, all-fiber networks provide the most capable, cost effective and future-proof means for the Commission to achieve our national educational goals and to ensure continued global educational and economic leadership.

CONCLUSION

The E-rate modernization NPRM provides an unparalleled opportunity for the Commission to take a major step towards ensuring that children and lifelong learners have access to 21st century broadband services and tools that are so essential to our economic future and global competitiveness. Among the core policies the Commission should adopt is a requirement that all schools and libraries have fiber connectivity – and that they have access to this capability as rapidly as possible. As discussed herein, only all-fiber networks – which have superior performance capabilities and are future-proof – can provide symmetrical ultra-high-speed services that are so critical for schools and libraries. The Council looks forward to working with the Commission to achieve this objective.

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[56] Broadband Imperative Report at 9.

Respectfully Submitted,

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