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

In the Matter of	)	
	)	
Modernizing the E-rate	)	
Program for Schools and Libraries	)	WC Docket No. 13-184
	)	

COMMENTS OF PCIA – THE WIRELESS INFRASTRUCTURE ASSOCIATION AND THE HETNET FORUM

I. INTRODUCTION & SUMMARY

PCIA – The Wireless Infrastructure Association and The HetNet Forum, a membership section of PCIA ("PCIA"),[1] respectfully submit these comments on behalf of its members in response to the Federal Communications Commission's ("FCC" or "Commission") *Notice of Proposed Rulemaking* on the modernization of the E-rate program for schools and libraries.[2]

The E-rate program has been extremely successful in connecting a vast majority of the nation's schools and libraries to the Internet. But today's challenge is to modernize the E-rate program so that these connections are robust enough to support the next generation of learning at these institutions. To ensure that the E-rate program can sufficiently deliver broadband capacity, the FCC should adopt a "whole networks" approach to E-rate funding. A "whole networks" approach will provide schools and libraries greater flexibility in network design and foster

[1] PCIA is the national trade association representing the wireless infrastructure industry. PCIA's members develop, own, manage, and operate towers, rooftop wireless sites, and other facilities for the provision of all types of wireless, telecommunications, and broadcasting services. PCIA and its members partner with communities across the nation to affect solutions for wireless infrastructure deployment that are responsive to the unique sensitivities and concerns of each community. The HetNet Forum, formerly The DAS Forum, is a membership section of PCIA dedicated to the advancement of heterogeneous wireless networks. "Heterogeneous networks" combine "macro," or large, infrastructure such as monopoles with small cells and distributed antenna systems. By integrating the two types of infrastructure together, carriers are able to target geographic areas to increase network capacity.

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

increased efficiencies in both the speed of deployment of advanced communications networks and lower costs relative to performance. Further, the FCC should provide mechanisms that support "bring your own device" ("BYOD") initiatives. Additionally, the Commission should not create a new hierarchy of most-favorite technology and should avoid categorizing specific broadband delivery methods as preferred. Finally, the Commission should also investigate how to incentivize state and local governments to streamline regulatory barriers that might impede development of the wireline and wireless infrastructure that supports the mobile classroom. These barriers can constitute a significant portion of the cost of infrastructure facilities and lengthen the time it takes to construct them; lowering barriers thus lowers costs.

II. BACKGROUND

Since its inception as part of the Telecommunications Act of 1996, the E-rate program has been instrumental in delivering Internet access to America's schools and libraries.[3] Now, the capacity of those connections must be expanded to accommodate bandwidth-intensive applications like video streaming and multiple connected devices per classroom. In launching the ConnectED initiative, President Obama recognized that schools and libraries service numerous end-users and must have the connectivity to provide sufficient access.[4] This connectivity is two-pronged: high-capacity broadband to the school or library and high-speed wireless access in and about their facilities.[5] The importance of each is underscored by the President's goal of servicing 99% of students in the next five years with broadband.

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[3] *E-rate NPRM* ¶ 2 ("By 2005, nearly all schools had access to the Internet, and 94 percent of all instructional classrooms had Internet access. Similarly, by 2006, nearly all public libraries were connected to the Internet, and 98 percent of them offered public Internet access.").

[4] *See* CONNECTED FACT SHEET.

[5] *Id*.

High-capacity broadband is already creating numerous opportunities to customize, broaden, and improve the educational experience for students and library patrons. Educators have been quick to leverage mobile technology to bring new tools to the classroom. A survey of middle and secondary school teachers found that teachers and students use a variety of devices in the classroom or to complete assignments, including cell phones (73%), e-readers (45%), and tablet computers (43%).[6] Many schools and school districts are actively adopting these devices by the thousands and incorporating them into the day-to-day activities of students and teachers alike.[7] The U.S. Department of Education and the FCC also support efforts to transition from traditional physical textbooks to digital textbooks, which utilize broadband connectivity to access up-to-date multimedia content and lesson plans.[8] As mobility allows learning to leave the classroom, it also highlights the need for expanded connectivity in the surrounding community, including libraries and students' homes.[9]

Considering that tablets and digital textbooks, which generate more than double the traffic of smartphones,[10] will remain active at the student's or teacher's fingertips throughout the school day, a school's need for broadband capacity and access points will increase exponentially. Currently, many schools' and libraries' connections do not meet their growing bandwidth needs,

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[6] KRISTEN PURCELL ET AL., PEW RESEARCH CENTER'S INTERNET AND AM. LIFE PROJECT, HOW TEACHERS ARE USING TECHNOLOGY AT HOME AND IN THEIR CLASSROOMS, 2-3, (2013), *available at* http://www.pewinternet.org/Reports/2013/Teachers-and-technology/Summary-of-Findings.aspx.

[7] Carla Rotella, *No Child Left Untableted*, N.Y. TIMES MAGAZINE, Sept. 12, 2013, http://www.nytimes.com/2013/09/15/magazine/no-child-left-untableted.html?_r=2& (stating that every student and teacher in 18 of Guilford County's [N.C.] 24 middle schools received a tablet, 15,450 in all, prior to the 2012-2013 school year); *See also* The White House, CONNECTED: PRESIDENT OBAMA'S PLAN FOR CONNECTING ALL SCHOOLS TO THE DIGITAL AGE, 4-5 (2013), *available at* http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf ("CONNECTED FACT SHEET").

[8] *See* Federal Communications Commission, DIGITAL TEXTBOOK PLAYBOOK FACT SHEET (Feb. 1, 2012), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-312244A1.pdf.

[9] *Id*. (stating that need home broadband to access digital content and to complete Internet based homework).

[10] Cisco, CISCO VISUAL NETWORKING INDEX: GLOBAL MOBILE DATA TRAFFIC FORECAST UPDATE, 2012 – 2017, 9 (Feb. 6, 2013), *available at* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf.

and cost of installation and service remains a significant barrier.[11] To support a truly one-to-one digital learning environment, the E-rate program must support the deployment of broadband infrastructure that will not only address immediate needs but also plan for the future growth of broadband-enabled devices and applications.

III. E-RATE SHOULD PROVIDE MORE EQUITABLE FUNDING FOR INTERNAL CONNECTIONS THROUGH A "WHOLE NETWORK" APPROACH

A "whole networks" approach would provide schools and libraries greater flexibility in network design and would foster increased efficiencies in both the speed of deployment of advanced indoor networks and lower costs relative to performance.[12] Under a whole networks approach additional freedom is given to those applicants to design and maintain their networks. This regulatory model avoids the pitfalls of certain categories of technology being funded merely because of their classification and not because of the benefit they may provide to a specific network.

PCIA supports the elimination of the prioritization of specific services—an approach that can effectively dictate technology choices. As currently implemented, allotted E-rate funds are often exhausted before reaching the priority two category of network elements.[13] A framework whereby the whole network is considered and where a systems administrator can target funds to address network-specific bottlenecks would help meet the goals of the E-rate program. This approach would also minimize the incentives for vendors to "re-characterize priority two

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[11] *E-rate NPRM* ¶¶ 5-6 (citing Federal Communications Commission, 2010 E-rate Program and Broadband Usage Survey: Report, 4-5 (Wireline Comp. Bur. 2011), 26 FCC Rcd 1, *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-10-2414A1.pdf (last visited Sept. 16, 2013)); American Libraries Association, *Libraries Connect Communities: Public Library Funding & Technology Access Study 2011-2012*, AMERICAN LIBRARIES MAGAZINE, at 23-24 (2012), *available at* http://viewer.zmags.com/publication/4673a369#/4673a369/1 (last visited Sept. 16, 2013).

[12] *E-rate NPRM* ¶¶ 146-47.

[13] *Id.* ¶ 62.

services as priority one services" or make schools and libraries choose between otherwise economically illogical options in lieu of less expensive priority two services.[14]

The Commission should not create arbitrary limits such as one router per building or one wireless access point per classroom. An indoor network is complex. The installation of a wired network requires access for the cabling that is insulated from interference, extreme temperatures, moisture, and other elements. Further, there must be space to run the cabling and space to house the routers, modems, switches and other network components. When wireless is added to the mix not only is the cabling required to provide backhaul to the wired connection, but new radiofrequency design elements have to be taken into account. This can include multiple antennas, boosters, relays and routers. The access points themselves need to be installed so that wireless interference is mitigated and the architecture of the school is taken into account. For example, a LEED certified school will likely have construction materials that are highly efficient and insulate heat energy. However, these same materials lessen a wireless signal's reach. Further, if a school is utilizing Wi-Fi and they are in a location where there are a number of other, external users utilizing Wi-Fi, say an apartment building next door, interference can become a bigger factor. In short, because of these complexities and others in the design of an internal wireless system, any suggestion that one router per building or one wireless access point per classroom is short-sighted.[15]

Broadband connections need to be accessible where the learning is taking place. In the early days of E-rate often times connections would be focused in computer labs, school libraries or other designated learning spaces. Today, the movement is towards a mobile device in the

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[14] *Id*. ¶ 146.

[15] Notice of Ex Parte of the State E-rate Coordinators' Alliance (SECA), CC Docket No. 02-6, at 8 (filed Jun. 24, 2013), *available at* http://apps.fcc.gov/ecfs/document/view?id=7520924964.

hands of every student, one-to-one. A wired classroom with a high capacity wireless router would expand the usefulness of the wired connection to the school. It may be informative to examine the university setting with regards to high speed wireless networks. On the American university campus, cell phones are nearly ubiquitous for faculty, staff, students, and visitors. To meet the needs of the University of Michigan, ExteNet Systems provided a network plan that both would increase cellular service outdoors and also indoors through the installation of indoor wireless systems for over 200 buildings.[16] In addition to retransmission of cellular service, the Distributed Antenna System ("DAS") networks deployed are also capable of supporting a university's private and public Wi-Fi networks.

Internal wireless networks in schools and libraries should be capable of supporting one-to-one device initiatives as well as the ability to support BYOD. In order to support the high-capacity applications of tomorrow – which include peer-to-peer high definition video and the sharing of larger and larger data files – 1 Mbps may not be enough.[17] With more and more data being served and sorted from the cloud and then pushed to devices, a robust high-speed per user network is required to fully utilize these resources.

To realize the benefit of each student having their own device to explore and learn at their own pace, there should be flexibility designed into the network to securely support BYOD

[16] *See* Mary Eileen McLaughlin & Dave Fasshauer, *University of Michigan Campus-Wide DAS Project ExteNet Systems Implementation*, Augmenting Mobile Broadband in Your Community – An Overview of Distributed Antenna Systems and Small Cell Solutions (Feb. 1, 2012) http://transition.fcc.gov/presentations/02012012/panel-2/mary-mclaughlin_dave-fasshauer.pdf; http://www.fcc.gov/events/augmenting-mobile-broadband-your-community-overview-distributed-antenna-systems-and-small-cel. *See also* ExteNet Systems http://extenetsystems.com/servingourcustomers/higher-education.aspx (last accessed Sept. 16, 2013).

[17] *See E-rate NPRM* ¶ 27 (seeking comment on whether 1 Mbps is enough speed to support one-to-one goal within ConnectED).

policies.[18] Just as the Federal workforce is examining the benefits and challenges of BYOD policies so are American schools.[19] In the workforce setting BYOD allows employees to be connected remotely and to utilize the device of their preference where they can be most productive. Students should have the same ability to utilize the devices they have at home to contribute to their in-school education. Further, it allows students to operate on newer technology and better adjust to changes in operating systems and work flow, changes they will need to be comfortable with as they launch their careers.

Consistent with its support of the elimination of service prioritization, PCIA urges the Commission not to adopt a regulatory preference for the deployment of fiber and other technologies over existing or future broadband delivery technologies.[20] The FCC should remain technology-neutral and avoid initiating a new *de facto* prioritization schedule where the agency picks technological winners. As discussed above, freedom in network design should be the goal. Different settings necessitate varied technologies due to any number of variables, including access to public rights-of-way, environmental, historic considerations, etc. Therefore, the FCC should maintain technological flexibility and not implement a preference for the deployment of one technology over another.

IV. THE FCC SHOULD ENCOURAGE STATE AND LOCAL GOVERNMENTS TO MAKE POLICY CHANGES THAT HELP REDUCE NEW BUILD COSTS

The provision of broadband services to the classroom ultimately relies on infrastructure for transport. A significant portion of the cost and build time of infrastructure facilities is

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[18] *See BYOD to School?*, SCHOLASTIC ADMINISTR@TOR, http://www.scholastic.com/browse/article.jsp?id=3756757 (last accessed Sept. 16, 2013 (raising the benefits and safety concerns, including those implicated in the Children's Internet Protection Act).

[19] *See* Kenneth Corbin, *Federal CIOs Grapple With BYOD, Mobile Workforce*, CIO.COM (Apr. 30, 2013) http://www.cio.com/article/732606/Federal_CIOs_Grapple_With_BYOD_Mobile_Workforce.

[20] *See E-rate NPRM* ¶¶ 74-75 (where the Commission asks whether certain preferences should be given for fiber deployment to schools and libraries).

incurred by state and local regulations, particularly zoning and permitting regulations.[21] For example, applicants may be required to conduct multiple reviews of alternative siting locations (necessitating engineering studies), pay consultant fees for review of the application, and post large bonds for the removal of facilities.[22] These costs are part of the total investment service providers make into their facilities, which drive up costs to customers.

It follows that streamlining regulations in a way that reduces their cost will also lower costs for customers. The Commission has repeatedly taken such actions in both the wireline and wireless contexts.[23] The Commission should develop incentives in the context of the E-rate program that could prompt state and local governments to adopt written commitments or codify regulations that create a more streamlined environment for last-mile connections as well as essential middle-mile and backhaul connections.[24] For example, the Commission could allow E-rate applicants to receive larger subsidies if the state or local government under whose

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[21] PCIA has previously documented the inefficiencies that arise as a result of the inconsistent way in which jurisdictions across the country treat wireless facilities for zoning and permitting purposes. *See generally* Comments of PCIA – The Wireless Infrastructure Association and The DAS Forum (A Membership Section of PCIA), WC Docket No. 11-59 (Jul. 18, 2011), http://apps.fcc.gov/ecfs/document/view?id=7021693804.

[22] *See, e.g.*, City of Sandy Springs Zoning Ordinance, Ordinance No. 2005-12-19, art. XIX, § 19.4.8(D) (Dec. 1012), *available at* http://www.sandyspringsga.org/SandySprings/media/Zoning-Ordinances/Article-XIX--Administrative-Permits---Use-Permits.pdf (requiring 16 separate elements for a Use Permit application, including an engineering study of *future* coverage areas of *other service providers*). *See also* SAN FRANCISCO PUBLIC WORKS CODE, art. 25, § 1519 (2010), *available at* http://www.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$sync=1 (limiting the term of a permit of a personal wireless service facility to 2 years, necessitating constant expenditure by the tower owner to renew the permit and comply with any additional requirements the City wishes to impose); Global Tower, LLC v. Hamilton Township, 897 F. Supp. 2d 237, 244 (M.D. Pa. 2012) (noting that an application for a 250' tower underwent twenty hearings over the course of more than 1 year).

[23] *See, e.g.*, Wireless Telecommunications Bureau Offers Guidance on Interpretation of Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, *Public Notice*, DA 12-2047, 28 FCC Rcd 1 (Jan. 25, 2013), *available at* http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-12-2047A1_Rcd.pdf; *In re* Implementation of Section 224 of the Act; A National Broadband Plan for Our Future, *Report and Order and Order on Reconsideration*, 26 FCC Rcd 5240 (2011); *In re* Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance, *Declaratory Ruling*, 24 FCC Rcd 13994 (2009), *aff'd*, City of Arlington, Texas v. FCC, 133 S. Ct. 1863 (5th Cir. 2012).

[24] PCIA respectfully suggests that the Commission should consider infrastructure-related incentives for other programs in the Universal Service Fund as well.

jurisdiction they operate has committed to developing a task force to identify and mitigate, in cooperation with industry stakeholders, regulatory hurdles for telecommunications infrastructure development. Additionally, PCIA agrees with the Commission's suggestion that state and local governments should be rewarded for implementation of forward-thinking "dig-once" and similar initiatives.[25]

[25] *E-rate NPRM* ¶ 164.

V. CONCLUSION

For the foregoing reasons, PCIA urges the Commission to adopt reforms to E-rate that support a "whole networks" approach to funding, including support for internal networks, provide greater flexibility in prioritization of upgrades and investigate how to incentivize state and local governments to streamline regulatory barriers that might impede development of the wireline and wireless infrastructure that supports the mobile classroom.

Respectfully submitted,

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