

**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 COMCAST CORPORATION**

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Comcast Corporation and its affiliates (“Comcast”) hereby submit these comments in response to the Notice of Proposed Rulemaking (“Notice” or “NPRM”) released by the Federal Communications Commission (“FCC” or “Commission”) in the above-captioned proceeding.<sup>1</sup>

**I. INTRODUCTION AND SUMMARY**

The Internet is transforming education and how children learn both at home and at school. Among other uses, high-speed broadband access can enrich curriculum and enhance the learning process by permitting students to use digital textbooks, work on multimedia projects, stream educational video content, conduct Internet-based research, take online courses that are not locally available, and interact with content experts.<sup>2</sup> These digital tools can improve learning outcomes for our nation’s students and prepare the next generation for success in an increasingly

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<sup>1</sup> *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) (“Notice” or “NPRM”).

<sup>2</sup> *The Broadband Imperative: Recommendations to Address K-12 Educational Infrastructure Needs*, State Educational Technology Directors Association (rel. May 21, 2012), <http://www.setda.org/web/guest/broadbandimperative> (“SETDA Broadband Imperative Report”).

competitive digital world.<sup>3</sup> As President Obama recognized in announcing the ConnectED initiative, “our schools [must be] an integral part of the broadband and technology transformation” in order to ensure that students “can benefit from these advances in teaching and learning.”<sup>4</sup> In particular, America’s classrooms must have access to the advanced broadband networks that will support a modern digital learning environment.<sup>5</sup>

Comcast shares the Commission’s goal of fostering high-speed broadband connections to our nation’s schools and libraries.<sup>6</sup> Comcast also firmly believes that broadband Internet connectivity at school must be complemented by broadband access at home if Americans are to gain the full educational benefits of the Internet.<sup>7</sup> That is why, in addition to providing

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<sup>3</sup> See, e.g., *Connecting America: The National Broadband Plan*, FCC, at 226 (rel. March 16, 2010), <http://download.broadband.gov/plan/national-broadband-plan.pdf> (“[b]roadband can be an important tool to help educators, parents and students meet major challenges in education”) (“National Broadband Plan”); Press Release, *Statement from U.S. Education Secretary Arne Duncan on FCC Action to Connect More Students to High-Speed Internet* (July 19, 2013), <http://www.ed.gov/news/press-releases/statement-us-education-secretary-arne-duncan-fcc-action-connect-more-students-hi> (“The U.S. once led the world in connecting our schools to the Internet, but our strongest international competitors are surging ahead of us because they know that giving students and teachers the right tools is vital to their economic strength.”) (“Duncan Statement”).

<sup>4</sup> *ConnectED: President Obama’s Plan for Connecting All Schools to the Digital Age*, The White House, [http://www.whitehouse.gov/sites/default/files/docs/connected\\_fact\\_sheet.pdf](http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf).

<sup>5</sup> *Id.* (“Our schools were designed for a different era. . . . This system does not take into account the constant learning opportunities of global connectivity[.]”).

<sup>6</sup> While the comments at times focus on schools, Comcast believes that the reforms and measures proposed herein should apply with equal force to the participation of libraries in the E-rate program.

<sup>7</sup> See, e.g., Presentation by LEAD Commission Co-Chairs Margaret Spellings and James P. Steyer before the Federal Communications Commission, *Paving a Path Forward for Digital Learning in the United States*, at 1 (July 19, 2013), [http://www.leadcommission.org/sites/default/files/LEAD%20Statement.FCC%20Meeting%207-19-13.final\\_\\_0.pdf](http://www.leadcommission.org/sites/default/files/LEAD%20Statement.FCC%20Meeting%207-19-13.final__0.pdf) (“With digital textbooks, online lessons, learning games and peer networks, we can help students enjoy better lessons in school – and at home, too.”) (“LEAD Presentation”).

high-speed connectivity to thousands of schools and libraries across its footprint, Comcast created the Internet Essentials program in 2011, which already has connected nearly 900,000 low-income Americans to broadband Internet access in their homes.<sup>8</sup> Moreover, expanding the availability of broadband Internet access in both classrooms and homes will underscore the overall educational value of broadband and, thus, also advance the Commission's goal of "addressing relevance barriers to broadband adoption and utilization."<sup>9</sup>

Because of the E-rate program's potential to provide many more students access to the transformative power of high-speed broadband, Comcast supports the Commission's efforts to modernize the program, including by initiating this proceeding. As the bi-partisan Leading Education by Advancing Digital ("LEAD") Commission has observed, "[t]he centerpiece of solving the infrastructure challenge is E-Rate."<sup>10</sup> Over the past two decades, the E-rate program has succeeded in ensuring that many elementary and secondary schools have access to basic

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<sup>8</sup> David L. Cohen, Executive Vice President, Comcast Corporation, *Internet Essentials Connects More than 220,000 Low-Income Families to the Power of the Internet*, Comcast Voices Blog (Aug. 12, 2013), <http://corporate.comcast.com/comcast-voices/internet-essentials-embarks-on-year-three-connects-more-than-220000-low-income-families-or-900000-americans-to-the-power-of-the-internet-at-home> ("Cohen Internet Essentials Blog Post").

<sup>9</sup> National Broadband Plan at 178.

<sup>10</sup> *Paving a Path Forward for Digital Learning in the United States*, LEAD Commission, at 2 (viewed Sept. 15, 2013), <http://www.leadcommission.org/sites/default/files/LEAD%20Commission%20Blueprint%20-%20Final.pdf> ("LEAD Commission Report"). See also Press Release, *LEAD Co-Chairs Present at FCC Open Meeting on E-rate: LEAD Commission Commends FCC for Rulemaking to Update School Internet Connections*, LEAD Commission (July 19, 2013), <http://www.leadcommission.org/news/lead-co-chairs-present-fcc-open-meeting-e-rate> ("initiating this rulemaking . . . is the first in many steps to bring faster Internet connections to our nation's schools and unleashing the power of digital learning in our classrooms").

Internet connectivity at discounted rates.<sup>11</sup> Today, however, students need access to far more advanced and robust technologies to realize the full benefits of digital learning tools; as Senator Rockefeller noted, “basic Internet connectivity is no longer sufficient.”<sup>12</sup> The Commission’s challenge is to modify the existing program so that the Universal Service Fund (“USF” or “Fund”) provides support for the efficient deployment and operation of the broadband services and facilities needed to use advanced digital learning tools in the classroom. As with all USF programs, the Commission should do so in a financially responsible, cost-effective manner with a clear focus on the fact that the Fund is financed by U.S. consumers.

***Framework for Modernizing the Program.*** The Commission properly recognizes in its Notice that a key goal of the E-rate reform effort must be to modernize the current support program so that “schools and libraries have affordable access to 21st Century broadband that

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<sup>11</sup> See, e.g., News Release, *FCC Launches Modernization of E-Rate Program to Deliver Students & Teachers Access to High-Capacity Broadband Nationwide* (July 19, 2013), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2013/db0719/DOC-322284A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0719/DOC-322284A1.pdf) (“Over the past 15 years, support provided by the E-rate program has helped revolutionize schools’ and libraries’ access to modern communications networks, but the needs of schools and libraries are changing.”).

<sup>12</sup> See Press Release, U.S. Senate Committee on Commerce, Science, & Transportation, *Rockefeller Says E-rate Should Expand to Connect More Students to High Speed Broadband* (June 6, 2013), [http://www.commerce.senate.gov/public/index.cfm?p=PressReleases&ContentRecord\\_id=5cb24ad3-281e-4abd-acd0-afb699008e3e&ContentType\\_id=77eb43da-aa94-497d-a73f-5c951ff72372&Group\\_id=505cc3fa-a767-40f4-8ac2-4b8326b44e94](http://www.commerce.senate.gov/public/index.cfm?p=PressReleases&ContentRecord_id=5cb24ad3-281e-4abd-acd0-afb699008e3e&ContentType_id=77eb43da-aa94-497d-a73f-5c951ff72372&Group_id=505cc3fa-a767-40f4-8ac2-4b8326b44e94). See also, e.g., NPRM, Statement of Commissioner Jessica Rosenworcel (“we are quickly moving from a world where what matters is connectivity to a world where what matters is capacity”) (“Rosenworcel Statement”); Comments of AASA: The Schools Superintendents Association and the Association of Educational Service Agencies, WC Docket No. 13-184, at 1 (Aug. 27, 2013) (“Though most schools and libraries are now connected to the internet, the quality and speed of that connection does not always meet the demand.”) (“AASA/AESA Comments”).

supports digital learning.”<sup>13</sup> Providing an up-to-date educational experience requires more than a high-capacity broadband connection to school buildings. In designing its reforms, the Commission must take a broader approach that recognizes that digital learning not only requires a broadband connection to each school, but also the infrastructure within the school that can deliver the bandwidth and technology that meets each classroom’s needs, including teacher and student access to that infrastructure.

The program as a whole should be driven by what educational institutions really need, not by artificial aspirational guidelines. For example, one Gbps connections to schools may or may not be the right capacity answer for some or all schools. Moreover, such an approach focuses on the capacity of the *school’s* connection rather than the broadband capacity available to students in the *classroom*. To ensure that the program is focused on student and classroom needs, a process should be established for both identifying the digital learning tools that elementary and secondary students will need to succeed in the competitive world of the 21st century and determining the broadband performance targets (*e.g.*, bandwidth capacity, latency) that must be met to support those tools. That, in turn, will dictate the internal and external network infrastructure required to deliver the necessary bandwidth to classrooms. The updated E-rate program should be recast to support such “whole network” solutions and thereby provide elementary and secondary schools with access to both the expertise and financing to design and install robust networks – from the broadband connection to connectivity within the classroom – that can meet the digital learning needs of their students in a cost-effective manner. To do so, the

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<sup>13</sup> NPRM ¶ 17. *See also, e.g.*, LEAD Presentation at 3 (“the *sine qua non* is to bring high-speed broadband to the schools” and “[t]he way to do this is to modernize the E-Rate program . . . [n]othing else can happen if the infrastructure isn’t in place”).

Commission should provide additional unlicensed spectrum for services such as Wi-Fi. The Commission also must revamp the current priority system, which today provides inadequate incentives for deploying broadband infrastructure *within* a school. In addition, the Commission immediately should begin to transition E-rate funding away from legacy, narrowband services in order to maximize the funding available for high-capacity broadband connectivity. Finally, the Commission also should authorize the use of E-rate funds for services and technologies (*e.g.*, caching services) that will optimize efficient use of available bandwidth.

***Efficient Network Design.*** As part of its effort to improve the effectiveness of the E-rate program, the FCC should explore ways to enhance schools and libraries' ability to make the most efficient use of the funds they receive. Specifically, the E-rate reforms should provide schools and libraries with access to technical resources that can assist them in formulating efficient network plans. One way this could be done would be to offer schools and libraries access to "digital template" software that could help them readily determine the parameters of the broadband network that will meet their particular requirements. Each school or library then could build upon the information derived from the template and issue a Request for Information ("RFI") to solicit input from service providers, including information about the services they offer and their feedback regarding the school's initial network design proposal. In this way, a school or library could use the RFI process to develop an efficient network design and to identify technology solutions that meet its needs. The school or library could then issue a detailed Request for Proposal ("RFP") that would enable it to select the most cost-effective vendor that is capable of fulfilling its identified broadband requirements. Coupled with the expanded use of multi-year contracts and other programmatic reforms, schools and libraries that take advantage

of these resources would be able to make more informed choices through a more manageable and less burdensome administrative process.<sup>14</sup> While schools and libraries should not be required to use these tools, the E-rate program should fund only those proposals that are carefully designed and based on an assessment of the individual educational institution's needs. The Commission could further improve the E-rate program's efficiency by streamlining the administrative process and clarifying certain rules and policies in order to simplify the process for E-rate participants.<sup>15</sup>

***Cost-Effectiveness.*** The Notice also seeks comment on other measures the Commission could take to maximize the cost-effectiveness of E-rate expenditures and eliminate waste, fraud, and abuse.<sup>16</sup> The steps noted above – overhauling the current funding priority system, transitioning support away from legacy services, and providing schools and libraries with the tools necessary to design efficient networks – will advance these important goals. The Commission could further advance these goals by: (1) maintaining its existing “primary factor” rule, which requires that price be given more weight than any other single factor in comparing bids; (2) providing greater certainty regarding sustained funding levels for multi-year projects; and (3) ensuring that funding requests are reasonable and properly tailored to the needs of the

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<sup>14</sup> Illustrative examples of questions and issues that could be included as part of these resources are attached. *See* Appendix A (outlining questions that could be posed by the digital template software); Appendix B (outlining information that could be included as part of an RFI); Appendix C (outlining information that could be included as part of an RFP).

<sup>15</sup> *See, e.g.*, National Broadband Plan at 238 (discussing the need to “streamline the E-rate application process”).

<sup>16</sup> NPRM ¶ 41.

applicant school or library in a way that is consistent with the educational objectives of the E-rate program.

## **II. AS A GROWING PROVIDER OF HIGH-BANDWIDTH BROADBAND CONNECTIVITY TO SCHOOLS AND LIBRARIES, COMCAST HAS A VITAL INTEREST IN MEANINGFUL REFORM OF THE E-RATE PROGRAM**

Comcast is actively involved in the current E-rate program and has a long-standing commitment to education and digital learning. As a result, Comcast has a direct and compelling interest in the Commission's E-rate reform efforts, which have potential both to "expand[] opportunity for students, teachers, parents and whole communities" and to further the Commission's broadband goals.<sup>17</sup> Increased online learning opportunities, evolving classroom models, interactive digital textbooks, and a host of other exciting developments are now available to students, and these developments will only continue to grow as schools increasingly integrate online learning tools. As the State Educational Technology Directors Association has recognized, the "transformation to a technology-rich learning environment" provides many positive learning opportunities:

Students actively use their laptops in class to access rich, multimedia-enhanced educational content from the Internet. They post their content . . . to school learning management systems, access their e-textbooks and get their assignments online, and collaborate daily across the network with other students via wikis and other Internet-based applications. Teachers regularly download streaming media to the classroom and take their students on virtual field trips to interact with subject area experts. Classes use videoconferencing systems to interact with other classes on campus, as well as students and content experts around the world. Formative and summative assessments are

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<sup>17</sup> *Id.* ¶ 1. See also *Schools and Libraries Universal Service Support Mechanism; A National Broadband Plan for Our Future*, Sixth Report and Order, 25 FCC Rcd 18762, ¶ 1 (2010) ("Access to broadband – at home or at anchor institutions – is a critical component of enabling everyone in America to develop the digital skills they need to prosper in the 21st century.") ("Sixth Report and Order").

conducted online for all students. The school expands its curriculum to include online courses, which students access at school, from home, and through various WiFi hotspots in the community. Teachers actively participate in online professional learning communities to share lessons and to participate in professional development.<sup>18</sup>

These opportunities, however, are dependent upon the availability of sufficient broadband for students both at school and at home. Comcast is committed to help solve both challenges and deliver the promise of digital learning to all children educated in the United States.

**At School.** Comcast, and the cable industry in general, have a long record of commitment to education and fostering the use of technology to enhance student learning. Among other initiatives, cable operators have made available cable and Internet connections to tens of thousands of schools and libraries through Cable in the Classroom. This initiative, started in 1989, initially sought to provide schools with a free cable connection and thousands of hours of educational programming. Today, Cable in the Classroom efforts are aimed at enhancing the growth of “Digital Citizenship,” a “holistic and positive approach to helping children learn how to be safe and secure, as well as smart and effective participants in a digital world.”<sup>19</sup>

In addition, Comcast provides fiber-based offerings to thousands of schools and libraries across the nation and provides services over its Hybrid Fiber-Coax platform to hundreds of schools and libraries that obtain E-rate funding today. Comcast has a robust fiber network and serves educational institutions throughout its footprint with Metro Ethernet connections or other

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<sup>18</sup> SETDA Broadband Imperative Report at 23.

<sup>19</sup> *Digital Citizenship*, Cable in the Classroom, <http://www.ciconline.org/DigitalCitizenship> (viewed Sept. 12, 2013).

fiber solutions.<sup>20</sup> While Comcast generally provides schools with broadband services ranging from 10 Mbps to 10 Gbps, more than half of the schools and libraries that Comcast currently serves employ bandwidth speeds of 100 Mbps or less. Nevertheless, the fiber connections that Comcast deploys to serve most of its school and library customers are scalable to 10 Gbps. If schools are given greater opportunities to upgrade their internal networks with high-capacity inside wiring and Wi-Fi to provide students with access to robust broadband service in their classrooms, Comcast readily can increase the transmission capacity of its fiber connections to the school to meet the demand for greater bandwidth in classrooms. As evidenced by its groundbreaking program to create millions of new high-speed Wi-Fi access points through its neighborhood hotspot initiative, Comcast has acquired and can share significant expertise in promoting high-speed wireless connections that allow each classroom to connect simultaneously to the local network.<sup>21</sup>

Comcast's experience has shown that schools that leverage the resources provided by the E-rate program to obtain access to faster, more advanced data services are able to enrich the educational opportunities available to their students.

- The Fort Wayne, Indiana school district replaced its T1-based network with Comcast's Business Ethernet Network Service, which provides the district with a 10 Gbps Ethernet connection to an aggregation point for multiple sites and a 1 Gbps or 2 Gbps Ethernet connection at each site. The school district has employed this increased bandwidth to take "electronic field trips" to destinations

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<sup>20</sup> As it does with all potential customers, Comcast would need to consider multiple factors in analyzing the cost-effectiveness of constructing high-speed last-mile facilities to reach a school in a specific geographic area within its footprint.

<sup>21</sup> See, e.g., News Release, *Comcast Unveils Plans for Millions of Xfinity WiFi Hotspots*, Comcast Corporation (June 10, 2013), <http://corporate.comcast.com/news-information/news-feed/comcast-unveils-plans-for-millions-of-xfinity-wifi-hotspots-through-its-home-based-neighborhood-hotspot-initiative-2>.

worldwide, including meeting NASA scientists and watching performances at the Shakespeare Festival in New York.

- Arlington Heights School District 25 and Township High School District 214, located just outside of Chicago, employ 1 Gbps Wide Area Networks (“WANs”) and 300 Mbps Internet access connections provided by Comcast to link sites and connect classrooms to high-speed broadband. Both districts use Comcast’s high-speed services to offer their students access to an expanded range of educational resources. These resources include “Web 2.0” sites that permit students and teachers to use the Internet to collaborate on projects and exchange ideas and the ability to interact directly with medical professionals using streaming video as part of a specialized high school training program.
- Comcast’s experience also demonstrates that deploying a modern high-capacity broadband network makes the most efficient use of a school’s limited financial resources. For example, the Arlington Heights school district estimates that the use of Comcast’s services has lowered its data costs from approximately \$117 per megabit to \$6.50 per megabit. Similarly, the Folsom Cordova Unified School District near Sacramento was able to upgrade its network infrastructure to handle faster transmission speeds despite significant financial constraints. The school district was able to replace its outdated service with an IP-based Comcast Internet service that increased the transmission speed available to the school by more than sixtyfold from 1.5 Mbps to 1 Gbps. Significantly, the school district was able to attain this substantial improvement in broadband capacity with only a marginal price increase.
- Improved access to high-speed Internet services also can help to reduce other costs that burden a school district’s limited resources. The Forsyth County school district, located in suburban Atlanta, historically has expended significant amounts each year to purchase textbooks. In 2008, that cost was approximately \$2.8 million. The county schools now rely on a 1 Gbps dark fiber WAN and 500 Mbps high-speed data service provided by Comcast to obtain access to interactive online content. As a result of its broadband connectivity, the school district’s annual textbook cost has decreased to \$400,000.

As these examples demonstrate, making modern broadband services available in elementary and secondary school classrooms will substantially expand the array of learning tools that can be accessed by both students and teachers. Further, these examples show that classrooms can be connected to 21st century technology in a cost-effective manner.

**At Home.** Broadband connectivity at home is a critical complement to access at school. For example, broadband at home enables students to get help with their homework, submit assignments online, collaborate with fellow students after school, access Internet-based research materials, develop multimedia projects, and use the advanced features of digital textbooks.<sup>22</sup> Similarly, broadband at home is necessary given that schools rapidly are moving to electronic means of communicating with parents and interacting with students. Indeed, teachers create connected teaching models that are “collaborative, coherent, and continuous”<sup>23</sup> and use tools such as Internet-based homework to “identify challenges, monitor progress, [and] tailor instruction to each student’s strengths and weaknesses much more effectively[.]”<sup>24</sup> Moreover, when students use broadband at home, parents are able to be more engaged in their child’s learning process and kept up-to-date on educational challenges and accomplishments.<sup>25</sup> Put simply, educators have 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.”<sup>26</sup>

To promote broadband connectivity at home for low-income families, Comcast has created the Internet Essentials program – the nation’s largest and most comprehensive broadband

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<sup>22</sup> SETDA Broadband Imperative Report at 9.

<sup>23</sup> *Transforming American Education: Learning Powered by Technology*, National Education Technology Plan 2010, U.S. Department of Education, at 41 (Nov. 2010), <http://www.ed.gov/sites/default/files/netp2010.pdf>.

<sup>24</sup> *Parents’ and Teachers’ Attitudes and Opinions on Technology in Education*, LEAD Commission, at 5, 20 (Aug. 2012), <http://www.leadcommission.org/sites/default/files/LEAD%20Poll%20Deck.pdf>.

<sup>25</sup> *Id.* at 20.

<sup>26</sup> SETDA Broadband Imperative Report at 9.

adoption program.<sup>27</sup> In addition to low-cost broadband, Internet Essentials gives eligible families the opportunity to purchase an Internet-ready computer at a discount. The final component of the program is access to a full suite of digital literacy training materials that are offered online, in print, and in person. Live training sessions can be attended by all members of a community, not just Internet Essentials families. Notably, 98 percent of the participants in the program that responded to a recent survey indicated that the children in their household are using the Internet Essentials service for school assignments, and 94 percent of these individuals indicated that the program has positively impacted their child's grades.

In approximately 22 months, the program has connected nearly 900,000 low-income Americans to broadband Internet access in their homes, most for the very first time.<sup>28</sup> The program will continue to grow as Comcast engages in ongoing outreach efforts.<sup>29</sup> Comcast also has sought to continuously improve the program. In the past year, among other enhancements, Comcast has:

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<sup>27</sup> David L. Cohen, Executive Vice President, Comcast Corporation, *Internet Essentials – An Ambitious and Comprehensive Broadband Adoption Experiment*, Comcast Voices Blog (Aug. 12, 2011), <http://corporate.comcast.com/comcast-voices/internet-essentials-an-ambitious-and-comprehensive-broadband-adoption-experiment> (“As the nation’s largest Internet service provider, Comcast has launched Internet Essentials, the country’s most comprehensive and ambitious broadband adoption program. Internet Essentials addresses all three of the primary barriers to broadband adoption that research has identified – 1) a collection of digital literacy issues, including fear of the Internet and a lack of understanding of how the Internet is relevant and useful, 2) the cost of a home computer, and 3) the cost of Internet service.”).

<sup>28</sup> Cohen Internet Essentials Blog Post.

<sup>29</sup> *Id.* (“[O]ur momentum continues to grow. In the last six months, we signed up 70,000 new families to the program – that’s more than 10,000 more families than we enrolled in the prior six month period – and more than the number of families enrolled in the previous two periods we have reported.”).

- increased the speed offered by the program for the second time in two years, now to 5 Mbps downstream and 1 Mbps upstream;
- expanded eligibility to include all students eligible to participate in the National School Lunch Program, including private, parochial, and homeschooled students;
- made it easier for families to register for the program through a streamlined enrollment process and an online application tool; and
- to help reach more households, established a bulk purchase and registration process for community partners and introduced Internet Essentials Opportunity Cards for organizations to purchase Internet service in advance for eligible families.<sup>30</sup>

Comcast has achieved this success due to strong support and collaboration with community partners. Comcast has partnered with almost 7,000 community-based organizations, government agencies, and federal, state, and local officials. In addition, Comcast has publicized the program in more than 4,000 school districts and 30,000 schools across its footprint; has distributed more than 27 million brochures to help spread the word about the program; and has broadcast nearly 2 million public service announcements.

### **III. THE COMMISSION SHOULD MODERNIZE THE E-RATE PROGRAM BY ENSURING THAT FUNDING ENABLES THE EFFICIENT DELIVERY OF DIGITAL LEARNING TOOLS TO ELEMENTARY AND SECONDARY SCHOOL CLASSROOMS AND LIBRARIES**

The E-rate program, as currently structured, is not meeting its full potential. As Secretary of Education Duncan has noted, “the bandwidth of the typical American school is far too low to support today’s learning technologies and demands.”<sup>31</sup> Further, the current priority system has

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<sup>30</sup> *Id.*

<sup>31</sup> Duncan Statement. *See also, e.g.*, NPRM, Statement of Acting Chairwoman Mignon L. Clyburn (“[I]n a 2010 FCC survey of schools and districts, nearly half of respondents reported lower speed Internet connectivity than the average American home.”); Rosenworcel Statement (“only 15 percent of schools believe they have the bandwidth they need for instructional purposes”); *The Need for Speed*, Education SuperHighway, available at <http://www>.

the effect not only of denying funding for components needed for broadband networks within schools (*e.g.*, Wi-Fi routers, gateways, wiring), but at times also encouraging the deployment of networks based on eligibility for priority one funding rather than the most efficient network design.<sup>32</sup> Moreover, the multi-step application process, year-by-year funding requirements, and funding delays may discourage some schools and libraries from fully participating in the E-rate program.<sup>33</sup>

As discussed below, the Commission should modernize the E-rate program in a way that addresses these current shortcomings. As a first step, the Commission should develop a framework for the new program that will facilitate deployment of advanced networks within schools to ensure that students receive the benefit of digital learning opportunities in their classrooms. The Commission then should establish measures that allow schools and libraries to develop plans, and receive funding, for scalable networks that deliver robust broadband connectivity to their students and library patrons.

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[educationsuperhighway.org/the-need-for-speed.html](http://www.educationsuperhighway.org/the-need-for-speed.html) (last accessed Aug. 16, 2013) (“The typical public school has the same Internet access as the typical home – but with 100% more users.”); *The Connectivity Gap*, Education SuperHighway, <http://www.educationsuperhighway.org/the-connectivity-gap.html> (viewed Sept. 12, 2013) (“80% of K-12 schools have insufficient Internet access.”) (“Education SuperHighway – Connectivity Gap”).

<sup>32</sup> See, *e.g.*, NPRM ¶ 215 (seeking comment on how to “discourage” the practice of “seek[ing] support for priority one services because [schools and libraries] know they will receive support for those services, when in reality the services they need or are seeking are unsupported services, or priority two services that are often not funded”).

<sup>33</sup> See, *e.g.*, Comments of the American Association of School Administrators and the Association of Educational Service Agencies, GN Docket No. 09-51, at 6 (Nov. 20, 2009) (“Schools who are not participating often do not apply for the E-rate program because the overall process is seen as bureaucratic and complicated.”); Reply Comments of the Bill and Melinda Gates Foundation, GN Docket No. 09-51, at 4 (Dec. 9, 2009) (“those [libraries] that opt not to participate often cite the administrative burden of the E-rate application process as a deterrent to their participation”).

**A. Establishing a Framework for High-Capacity Broadband Funding**

To meet students’ evolving educational needs, the Commission should encourage the development of a planning paradigm that will assist schools in designing an end-to-end network – from the high-speed broadband network connection to the internal network infrastructure<sup>34</sup> – that will support modern digital learning tools in elementary and secondary school classrooms and in libraries. The first step in that process requires an in-depth understanding of broadband targets (*e.g.*, bandwidth capacity, latency) that a high-speed service must meet to enable students to take advantage of digital learning tools in the classroom (collectively, the “broadband performance benchmarks”).

Schools then need to be able to determine the network connection and internal transmission infrastructure that they will require in order to meet those broadband performance benchmarks. Generally speaking, a school’s plan for deploying an advanced network likely will involve three basic components: (1) a broadband connection to the school; (2) the infrastructure needed within the school to ensure that each classroom has access to sufficient bandwidth (*e.g.*, high-capacity inside wiring); and (3) a means of allowing multiple students in each classroom to connect simultaneously to the local network (*e.g.*, high-capacity Wi-Fi routers).<sup>35</sup> To ensure that the infrastructure does not become outdated, the technologies deployed as part of such an

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<sup>34</sup> See, *e.g.*, NPRM ¶ 143 (“internal connections are needed to make effective use of high-capacity connectivity to schools”).

<sup>35</sup> See, *e.g.*, *Why K-12 Networks Fail*, Education SuperHighway (viewed Sept. 12, 2013), <http://www.educationsuperhighway.org/why-k-12-networks-fail.html> (“In addition to a user’s device, online learning requires high-capacity Internet connections . . . to the door of the school, robust wired and wireless networks inside the building, and specialized software.”) (“Education SuperHighway – Why K-12 Networks Fail”).

advanced network must be scalable to account for the continued evolution and growth of digital applications and needs.<sup>36</sup>

Based on its experience in providing advanced Internet services, Comcast believes that, with the appropriate tools and guidance, a school in most cases should be able to determine, and obtain access to, the scalable high-speed broadband connection that meets its educational requirements. Distributing advanced broadband capacity throughout the school and in each classroom adds complexity, as the nuanced needs of individual schools vary widely. Large schools, for example, will have very different requirements than smaller schools. In particular, variables such as how a school was constructed, the number of floors in a building, and the existing electrical facilities will impact the school's specific technical needs. For example, it is significantly more challenging to propagate a Wi-Fi signal in a building that contains reinforced concrete walls than one with drywall, and additional wireless access points may be required to obtain an acceptable level of service.<sup>37</sup> In addition, schools will be at different stages in the

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<sup>36</sup> See, e.g., NPRM ¶ 16 (“[W]e recognize that the E-rate program’s goals and measures will likely need to be sufficiently flexible to accommodate the evolving technological needs of schools and libraries.”); Rosenworcel Statement (“Let’s be honest. Those needs are only going to grow.”); Comments of Union School Corporation, WC Docket No. 13-184 (Aug. 28, 2013) (“[B]andwidth usage has quadrupled over 5 years at our schools and is expected to increase as students and classrooms use available online educational resources, online classes and distance learning.”); Comments of Plevna Schools, WC Docket No. 13-184, at 1 (Aug. 27, 2013) (“[The FCC’s] responsiveness to the needs of schools and libraries through this funding should continue to expand based upon changing technology needs and what we are required to offer our students.”); Comments of the New York State Education Department, GN Docket 09-51, at 1 (Nov. 20, 2009) (“All broadband connections must use easily upgradeable technologies that enable citizens and institutions to improve their connectivity over time in response to advances in technology and increases in demand.”).

<sup>37</sup> Similarly, optimizing Wi-Fi coverage to a multi-floor building requires consideration of how radio waves will propagate both vertically and horizontally, as well as consideration of how

deployment of advanced digital networks to their classrooms. For schools with existing broadband connections, it may be possible to meet the minimum performance benchmarks simply by upgrading internal wiring. These schools should be permitted to – and encouraged to – undertake such cost-effective upgrades rather than incurring the unnecessary cost of replacing a school’s entire network infrastructure.

In other words, while there certainly will be network elements and basic capacity needs that are common across virtually all schools, there also will be numerous variations among individual school buildings and network infrastructures based on their particular circumstances. To address these variations, schools should be permitted to seek and receive E-rate funding for the services and network components that best meet their unique circumstances. As long as schools are proposing to deploy the basic network components identified above<sup>38</sup> in a manner designed to meet the broadband performance benchmarks, they should be eligible to receive funding for efficient, high-speed networks that will deliver high-capacity broadband to their classrooms and students.<sup>39</sup> As the Commission consistently has recognized, schools generally are in the best position to know their educational needs and “to procure from the full range of

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the intra-building wiring system that runs between floors can be accessed and used to deploy wireless infrastructure and hardware.

<sup>38</sup> See discussion *supra* at 16.

<sup>39</sup> As discussed below, schools should be given access to the technical resources and information that will assist them in identifying the basic network components they need and designing efficient networks, and the Commission should take measures to ensure that the solutions chosen are cost-effective. See discussions *infra* at Sections IV-V.

competitive options in the marketplace the most cost-effective broadband solutions for those needs.”<sup>40</sup>

Schools also should be permitted to implement measures that permit them to achieve the broadband performance benchmarks over a period of several years. Given the significant up-front capital expenses that may be incurred to deploy a network that effectively delivers high-speed broadband services to the classroom, some schools may be unable to fund their portion of the network costs in a single year. As long as a school’s incremental enhancements to its broadband network are scalable and capable of eventually meeting the specified classroom performance benchmarks, schools should be eligible to receive E-rate funding for these improvements.

Finally, the Commission should ensure that ample spectrum is available so that students in classrooms throughout a school can obtain efficient access to the broadband infrastructure. Given that the vast majority of connections to the Internet under this program likely will be

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<sup>40</sup> Sixth Report and Order ¶ 17. *See also, e.g.*, National Broadband Plan at 237 (“The FCC should give schools and libraries more flexibility to purchase the lowest-cost broadband solutions.”); *Federal-State Joint Board on Universal Service*, Report and Order, 12 FCC Rcd 8776, ¶ 432 (1997) (“the establishment of a single set of priorities for all schools and libraries would substitute [their] judgment for that of individual school administrators throughout the nation, preventing some schools and libraries from using the services that they find to be the most efficient and effective means for providing the educational applications they seek to secure”) (“First Report and Order”); News Release, *Reaction to Commissioner Ajit Pai’s Proposal for a Student-Centered E-Rate Program*, Statement of Former FCC Commissioner Deborah Taylor Tate (July 16, 2013), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2013/db0716/DOC-322217A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0716/DOC-322217A1.pdf) (“Different schools have different needs, and we need to provide local school boards and principals the flexibility to do what’s best for their students’ educational needs balanced with the fiscal pressures of their own budgets.”); Comments of Curtis Cearley, WC Docket No. 13-184 (Aug. 30, 2013) (“What may allow our suburban school district to leverage access and support our educational programs may not work as well for a rural district in Idaho. . . . Flexibility and autonomy at the local level are essential to improving the E-Rate program.”).

through Wi-Fi enabled devices, a student's connection to the Internet will only be as good as the wireless resources that student can access. Of course, that includes spectrum resources as well. In order to ensure that students get the full capabilities of the underlying wired broadband connection the Commission intends to support, the Commission needs to act expeditiously to provide additional unlicensed spectrum for services such as Wi-Fi. As Comcast has explained in separate pending proceedings before the Commission, use of the spectrum currently allocated for Wi-Fi has been a huge success, but that success has created a significant congestion problem. Demand for Wi-Fi capabilities is essentially outstripping the current supply.<sup>41</sup> The resolution of ongoing FCC proceedings, however, will dramatically improve the spectrum position for Wi-Fi and allow operators to potentially deliver Wi-Fi at gigabit speeds.<sup>42</sup>

**B. Enhancing the Ability of Schools and Libraries to Use E-Rate Funding to Deploy Modern Broadband Networks**

Some of the rules that currently govern the E-rate program discourage the efficient use of E-rate funding for the deployment of high-capacity broadband networks. For this reason, the National Broadband Plan encouraged the Commission to “reexamine specific E-rate rules that appear to limit the flexibility of applicants to craft the most cost-effective broadband solutions based on the types of broadband infrastructure, services and providers available in their

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<sup>41</sup> See, e.g., Comments of Comcast Corporation, ET Docket No. 13-49, at 14-17 (May 28, 2013).

<sup>42</sup> *Id.* at 19-20; Reply Comments of Comcast Corporation, ET Docket No. 13-49, at 21-24 (July 24, 2013).

geographic areas.”<sup>43</sup> The Commission should act on this recommendation by modifying two aspects of the current E-rate program.

*First*, the Commission should give schools greater control over their use of E-rate funds to bring modern technology to classrooms by adopting a “whole network” approach and eliminating the distinction between funding for broadband connections to the school and funding for the distribution of broadband capacity throughout the school.

*Second*, the Commission should modify the Eligible Services List (“ESL”) to begin transitioning support away from legacy services so that the maximum amount of funding is available for the services needed for efficient broadband connectivity.

1. Eliminate the Distinction Between Priority One and Priority Two Services

Under the current E-rate program, requests for all telecommunications, telecommunications services, and Internet connections (“priority one services”) receive top priority for funding,<sup>44</sup> while funding for internal connections and basic maintenance of internal connections (“priority two services”) has been limited to whatever money remains.<sup>45</sup> As a result, priority two services frequently have gone unfunded.<sup>46</sup> Over time, this system has dampened the

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<sup>43</sup> National Broadband Plan at 237. Indeed, the Commission recognized this principle when it established the original E-rate program, finding that “schools and libraries should have maximum flexibility to purchase the package of services they believe will most effectively meet their communications needs.” First Report and Order ¶ 425.

<sup>44</sup> 47 C.F.R. § 54.507(g)(1)(i).

<sup>45</sup> 47 C.F.R. § 54.507(g)(1)(ii).

<sup>46</sup> *See, e.g.*, NPRM ¶ 62 (“the total demand including priority two requests has exceeded the E-rate program’s [funds] almost every year since the program’s inception” and “more recently, the vast majority of requests for priority two services have gone unfunded”); National Broadband Plan at 237 (“the vast majority of schools and libraries, while receiving discounts to help pay for broadband services, do not receive funds for the internal infrastructure necessary to utilize

effectiveness of the E-rate program. Parties have noted that “lack of internal connections funding – due to increasing restrictions on the availability of priority two support – ha[s] become a barrier to adoption of higher speed connections for many schools and libraries.”<sup>47</sup> Further, even in instances where a school has deployed a high-speed broadband system, this priority system can result in inefficient network designs. As the Commission recognizes, schools and libraries currently have a perverse incentive to design their networks using priority one services that fit neatly within the ESL, even “in lieu of cheaper priority two services, like internal wireless connections.”<sup>48</sup>

To address these fundamental problems, the Commission should eliminate the distinction between priority one and priority two services. Instead, the Commission should adopt a “whole network” approach, under which “connectivity to schools and internal connections are funded together and all eligible services are given equal priority.”<sup>49</sup> Funding internal connections, such as inside wiring and Wi-Fi services, at the same priority level as other network components will allow students in each classroom to have access to digital educational tools. As the Commission notes, “[h]igh bandwidth connectivity to a school or library serves little purpose if students and

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increased broadband capacity”); Comments of the Education and Libraries Networks Coalition, GN Docket No. 09-51, at 3 (Nov. 20, 2009) (“there are not enough funds available for Priority Two services, causing the E-Rate program to deny assistance to many low-income schools that fall just below the 80% poverty level”).

<sup>47</sup> NPRM ¶ 143 (citations omitted).

<sup>48</sup> *Id.* ¶ 146. *See also id.* ¶ 215; LEAD Presentation at 5 (“Five years ago, LEAD’s blueprint for digital learning would have been prohibitively expensive with \$1,000 workstations, shrink-wrapped sub-par software, and torn-up walls to wire school buildings. Today, thanks to the plummeting costs of tablet and laptop computers, innovative cloud-based software, and enterprise Wi-Fi technology, implementation is more affordable.”).

<sup>49</sup> NPRM ¶ 146. *See also* National Broadband Plan at 237 (“The FCC should provide E-rate support for internal connections to more schools and libraries.”).

patrons inside are not able to use it effectively because internal wired and wireless connections are missing or insufficient.”<sup>50</sup> Eliminating the arbitrary distinction between the priority one and priority two categories also will promote the deployment of more efficient networks, rather than networks designed for the purpose of “receiving support for expensive services that provide functionality that [schools and libraries] do not need and will not use . . . simply because they are supported services.”<sup>51</sup>

2. Transition the ESL from Legacy Services to the Services Needed for Efficient High-Speed Broadband

The Commission properly recognizes that meeting the need for advanced broadband services in elementary and secondary school classrooms and libraries will require redirection of the E-rate program’s resources from legacy, narrowband services to modern wireline broadband

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<sup>50</sup> NPRM ¶ 143. *See also* LEAD Commission Report at 2 (“The most immediate and expensive barrier to implementing technology in education is inadequate high-speed Internet connectivity in the classroom.”); Education SuperHighway – Connectivity Gap (“schools also need robust wired and wireless networks using the most up-to-date standards to ensure that students and teachers can access digital learning resources from anywhere in their school”); Comments of El Camino Real Academy, WC Docket No. 13-184 (Aug. 29, 2013) (“Priority 2 funding . . . is the only way we have to get infrastructure funding for routers, switches, cable drops and wireless capacity for our school.”).

<sup>51</sup> NPRM ¶ 212. Should the Commission ultimately choose to maintain the arbitrary distinction between priority one and priority two services, it should, at a minimum, eliminate the current requirement to distinguish between telecommunications and Internet access services on FCC Form 470 or 471. The requirement to both distinguish between priority one and two services and determine the regulatory classification of the services in question is administratively burdensome and unnecessary. *See, e.g.*, Comments of the State E-Rate Coordinators’ Alliance, CC Docket No. 02-6 (July 12, 2012); Comments of the State E-Rate Coordinators’ Alliance, CC Docket No. 02-6, at 2 (Aug. 1, 2013); NPRM ¶¶ 248-251 (proposing to simplify the ESL and the application process by adopting a definition of eligible services that provides funding for eligible services regardless of regulatory classification).

and high-speed wireless services and infrastructure.<sup>52</sup> Toward this end, the Commission should modify the ESL to include only those services that can be used to provide students with access to high-capacity broadband networks and should no longer subsidize services that are not provided over broadband platforms. For example, services such as paging, directory assistance, and stand-alone legacy voice services no longer promote an educational purpose that warrants separate funding. To the contrary, “[p]aging services have grown increasingly obsolete with the advent and explosive growth of mobile technology and services,”<sup>53</sup> and “Internet search has largely replaced directory services.”<sup>54</sup> In order to increase funding for the key components of high-capacity broadband connectivity, funds must be shifted away from these and other outdated services that have little direct educational application.<sup>55</sup>

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<sup>52</sup> NPRM ¶ 65 (seeking comment “on possible updates to the list of services eligible for E-rate support and the related rules to focus funding on those services that provide high-capacity broadband to school and library buildings and those services and equipment that disseminate the high-capacity broadband within those buildings, while deprioritizing or phasing out support for services associated with legacy technologies and services that have little direct educational application”). See also Acting Chairwoman Mignon Clyburn, *3-Step Plan to Speed up Student Learning: Column*, USA TODAY (June 28, 2013), <http://www.usatoday.com/story/opinion/2013/06/28/mignon-clyburn-on-education-and-bandwidth/2459599/> (noting that the Commission must “tak[e] a hard look at where we’re spending money today” and “consider eliminating support for outdated services”) (“Clyburn Column”).

<sup>53</sup> NPRM ¶ 92.

<sup>54</sup> *Id.* ¶ 93.

<sup>55</sup> This transition is fully consistent with section 254 of the Communications Act of 1934, as amended. As the Commission recognized in modernizing the high-cost USF programs to focus on broadband in 2011, the statute “requires the Commission to update [its] mechanisms to reflect changes in the telecommunications market.” *Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform – Mobility Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, ¶ 10 (2011). Given that “voice ultimately [will be] one of many applications running

The Commission also should modify the ESL to ensure that funding is available for the equipment and services needed to maximize the efficiency of broadband connections. For example, as the Commission suggests, the E-rate program should provide support for caching services.<sup>56</sup> Caching services are high-speed storage mechanisms at the border of a network and the Internet that hold frequently-accessed Internet information. Use of these services would enable students to quickly obtain access to Internet-based information without consuming the school's existing bandwidth and incurring the cost of adding capacity. Providing support for caching services would enable schools to use a slower (and less expensive) Internet connection than would otherwise be required to deliver the same broadband capability to their classrooms if caching were not used.

Similarly, providing funding for bandwidth optimizers and Wi-Fi controllers would enable schools and libraries to make more efficient use of the available transmission capacity. Bandwidth optimizers help control data flow on the network by reducing bandwidth constraints and ensuring bandwidth availability, while Wi-Fi controllers manage certain attributes of every access point they control (*e.g.*, power) to minimize interference and maximize throughput. Permitting schools and libraries to receive funding for such tools would maximize the efficient use of the recipients' existing broadband connections; as a result, students would experience

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over fixed and mobile broadband networks,” reforming the E-rate program to focus more directly on high-speed broadband will squarely fulfill the Commission’s newest universal support principle of directing support “where possible to networks that provide advanced services, as well as voice services.” *Id.* ¶¶ 11, 45.

<sup>56</sup> NPRM ¶ 85.

faster connection times and “significant speed bottlenecks” would be eliminated.<sup>57</sup> Moreover, funding these services also would increase the efficiency of the E-rate program as a whole by maximizing the utilization of available bandwidth and leveraging network management tools that are more cost-effective than adding incremental network capacity.

**IV. THE COMMISSION SHOULD ENSURE THAT SCHOOLS AND LIBRARIES HAVE ACCESS TO THE RESOURCES NEEDED TO MAXIMIZE THE EFFICIENT USE OF E-RATE FUNDS**

Throughout the Notice, the Commission seeks comment on the desirability of providing “greater assistance to school and libraries” as well as “the complexity and associated burdens of the current E-rate application and associated review process.”<sup>58</sup> The Commission’s E-rate reforms should address both issues by furnishing additional technical and other support to schools and libraries while also reducing the program’s administrative hurdles. Such reforms will assist schools in obtaining efficient broadband service to their classrooms. Moreover, these changes will enhance the overall performance of the E-rate program by promoting a more competitive bidding process and contributing to the cost-effective delivery of the desired services to schools and libraries.

**A. Providing Schools and Libraries with Adequate Resources to Design Efficient Networks**

The Commission correctly seeks comment on whether it, the Universal Service Administration Company (“USAC”), or other entities “should take a more active role in assisting

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<sup>57</sup> *Id.* See also, e.g., Education SuperHighway – Why K-12 Networks Fail (citing “[m]isconfigured software, firewalls, or content filters” as one reason why a school’s Internet connection may be slow).

<sup>58</sup> NPRM ¶¶ 198-201, 224-270.

applicants in identifying cost-effective purchasing options”<sup>59</sup> and on whether to “require schools and libraries seeking support for high-capacity broadband to undertake a formal review and assessment of their broadband needs.”<sup>60</sup> These initiatives, which are intended to ensure that networks are designed and deployed efficiently, should have two primary objectives: (1) ensuring that schools and libraries have an adequate understanding of the network elements that they need to meet the specified broadband performance benchmarks; and (2) encouraging schools and libraries to obtain as much information as possible from technology vendors and service providers to aid in choosing efficient, cost-effective broadband solutions that will provide all students with access to digital learning tools.

Today, the E-rate program falls short of achieving these goals, as schools and libraries are not provided with sufficient assistance either in determining the communications services they require to fulfill their educational objectives or in collecting the data needed to make informed purchasing decisions. Developing a plan for effectively meeting an educational institution’s telecommunications and information services needs is a complex undertaking that requires specialized knowledge. The current program, however, does not encourage schools and libraries to seek potentially valuable advice from technology vendors and service providers. Moreover, potential bidders often are reluctant to provide applicants with any assistance, even answering basic questions, during the technology design and planning process because of concerns that they may inadvertently violate the FCC’s competitive bidding rules. Vendors and service providers appear to have been discouraged from offering technical assistance by USAC’s broad

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<sup>59</sup> *Id.* ¶ 198.

<sup>60</sup> *Id.* ¶ 217.

admonition that they should “not assist or help the applicant in any way during the competitive bidding process”<sup>61</sup> and “should avoid conduct that gives the appearance that the competitive bidding requirements have been compromised.”<sup>62</sup> Faced with such daunting technical and administrative obstacles, many schools and libraries currently employ, at their own expense, outside E-rate technology consultants with various levels of expertise to aid with network planning and to help navigate the lengthy and complicated E-rate administrative process. This approach is costly, and the quality of assistance can vary widely.

The current process needs to be overhauled in a way that allows schools and libraries to obtain access to necessary information from vendors and service providers, who are likely the most qualified to recommend optimal solutions. There may be several approaches to making such reforms to the E-rate program in ways that do not jeopardize the integrity of the competitive bidding process. One potential approach is detailed herein with the intent of helping to promote a collaborative dialogue among all affected stakeholders about changes to the program that would provide the most effective assistance to schools and libraries in identifying and seeking funding for their particular broadband service needs.

Because the overall goal of the reforms to the E-rate program should be to deliver advanced broadband services to elementary and secondary school classrooms and libraries, the first step in this process could be to provide schools and libraries with the opportunity to use a “digital template” to help them in devising a plan to meet their broadband needs. This template

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<sup>61</sup> *Introduction to E-Rate*, USAC, at 19 (May 2013), [http://www.usac.org/\\_res/documents/SL/training/2013/01-Introduction-to-E-rate-Spring.pdf](http://www.usac.org/_res/documents/SL/training/2013/01-Introduction-to-E-rate-Spring.pdf).

<sup>62</sup> *Responding to Bids*, USAC (viewed Sept. 15, 2013), <http://www.usac.org/sl/service-providers/step02/default.aspx>.

could be provided through simple-to-use interactive software that would aid the school (or library)<sup>63</sup> in estimating the transmission capacity it needs and suggest a network configuration that efficiently could deliver the necessary bandwidth to each classroom. A school could use the information provided by the template to prepare an RFI to solicit information from potential service and equipment providers. The responses to the RFI would provide specific information about the available technologies and how particular vendors would deploy their services and products to deliver the prescribed broadband performance speeds to the school's classrooms. Finally, the information furnished in response to the RFI should significantly enhance a school's ability to prepare a detailed RFP to solicit competing proposals for installing a broadband network that will meet the school's needs.

Put simply, fulfilling the goal of making broadband services available to every student in America's classrooms requires every school to have access to the resources necessary to design a high-capacity broadband network that is consistent with the broadband performance benchmarks. Indeed, in order to promote efficient and cost-effective solutions, the Commission must ensure that only those network proposals that are based on a sound analysis of classroom broadband needs and properly crafted to meet "whole network" objectives are funded. To be sure, schools that have substantial in-house technical capabilities may not need to use these resources to appropriately design their networks. For many schools, however, use of the tools should enable them to design and implement a successful network plan and make efficient purchasing decisions. While these schools may not need to rely on all three each time they seek E-rate support, the tools could prove particularly valuable when the school undertakes a significant

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<sup>63</sup> See *supra* note 6.

network upgrade. Use of these resources – particularly in combination with other measures such as streamlining program processes and permitting multi-year funding – likely also would reduce the overall administrative burden imposed on program participants.

1. Facilitate Design of a “Digital Template”

The Commission should encourage and facilitate the development of an interactive “digital template” that would provide meaningful assistance to schools (and libraries) in determining the basic parameters of a broadband network that will meet their particular needs.<sup>64</sup>

The template would ask a school to input data about several basic characteristics that would affect the design of a broadband network. Specifically, schools would provide information regarding the following four areas: (1) the sites involved (*e.g.*, number of classrooms, building materials); (2) the end user population (*e.g.*, total number of end users, typical applications used); (3) servers and services (*e.g.*, services needed); and (4) predicted usage (*e.g.*, likely usage of each WAN link, foreseeable changes to the end user population). For ease of reference, a more detailed list of potential questions is attached as Appendix A. Notably, all of the potential information requests contained in this list could be supplied in a straightforward manner using drop-down selection menus, check boxes, and simple data entry fields.

The digital template should translate the information provided by the schools into competitively neutral recommendations regarding the components of the advanced network that

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<sup>64</sup> For example, this digital template could build upon the work Education SuperHighway currently is undertaking in developing a “Network Cookbook” aimed at “shar[ing] high-speed networking best-practices among schools and districts in easy to implement steps, so they can configure their existing hardware for maximum efficiency and successfully implement future upgrades.” *Provide Technical Expertise to Schools*, Education SuperHighway, <http://www.educationsuperhighway.org/provide-technical-expertise.html> (viewed Sept. 15, 2013).

the school likely would need to deploy to meet the broadband performance benchmarks. For example, the output for many schools would include the amount of additional transmission capacity that must be delivered to individual buildings and the number of additional wireless routers needed to bring the necessary bandwidth to each classroom. In addition, the software should provide a rough configuration of the school's high-speed network, including not only the connections needed between and within sites, but also where specific equipment should be located to distribute broadband capacity efficiently in the building. These basic outputs would assist each school in formulating a plan for its broadband network and could form the basis of an RFI designed to obtain more precise specifications from service and equipment providers or could provide a check for evaluating the proposals received through the RFI process.

2. Use RFIs to Seek Information from Service and Equipment Providers

Although a digital template will aid schools (and libraries) in identifying their basic broadband needs, a school also should be able to build upon the outputs generated by the template to obtain more refined and precise network planning information and advice from experienced and credentialed service and equipment providers. As noted, schools today are discouraged from seeking such assistance because of uncertainty regarding the types of interactions between service providers and schools that are allowed before the competitive bidding process formally commences. The Commission should clarify the types of exchanges that are permissible. As one step, the Commission should encourage schools to use the same RFI process frequently used by commercial enterprises to obtain relevant information in advance of seeking service proposals. Indeed, the Commission should encourage schools to use the RFI

process as a means of obtaining expert advice and technical information that will assist their network planning efforts without undermining the competitive bidding system.

While some schools may wish to develop unique RFIs, the Commission should assist schools by providing a list of the basic elements an RFI should contain. To advance the discussion, Comcast puts forward a list of these elements in Appendix B. Generally speaking, an RFI issued by a school seeking assistance in planning its broadband network should have three primary components. First, the school should provide a detailed outline of its current infrastructure and needs. This information could be provided either by attaching the inputs to the digital template or by providing a narrative description that outlines items such as current and desired bandwidth, the number of buildings and classrooms, the total number of users, and the challenges the school faces today in meeting its needs. Second, the school should describe its primary goals and objectives in deploying or upgrading its network. In this section of the RFI, schools also could seek comments from vendors and service providers on the outputs from the digital template. Third, and most importantly, the school should outline the types of information it is seeking from potential bidders, including basic information regarding the company's available service offerings, a description of how these services are scalable to accommodate future needs, and the costs of these services.

Among other benefits, this type of RFI process: invites vendors and service providers to identify (in advance of a formal bid) problems they perceive in the school's stated goals or the outputs produced by the digital template; allows providers to build upon the digital template results to offer more detailed network design options or identify alternative designs; gives potential bidders a "head start" on assembling the resources needed to prepare a formal proposal;

and strengthens the value of the resulting agreement. In particular, schools will be able to use the information obtained through an RFI to craft a more detailed, effective RFP that is, in turn, likely to lead to more competitive bids for the precise services and capabilities the school needs. In other words, encouraging an open process that allows schools to work with vendors to mold and shape design plans before the formal bidding process begins will help to ensure that the most efficient and cost-effective solutions ultimately are selected.

3. Provide Guidance Regarding RFPs

The Commission also should assist schools (and libraries) in developing effective RFPs covering the broadband services and facilities they need. At present, the information provided on FCC Form 470 frequently is “so broad or narrow as to limit the number of vendors that could reasonably respond to the posting[.]”<sup>65</sup> RFPs, particularly those based on guidance from the Commission, can address this concern by providing “sufficient details to inform potential bidders of the scope, location, and any other requirements for the project” without pre-determining the outcome of the bidding process.<sup>66</sup> After using the digital template to obtain basic information about a suitable broadband network and an RFI to identify the technology solutions available to provide such a network, a school should be positioned to issue a well-informed RFP and select the vendor that can meet its specific service requirements in the most efficient and cost-effective manner. While the Commission should not mandate the use of any particular type of RFP, the

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<sup>65</sup> NPRM ¶ 205.

<sup>66</sup> *Open & Fair Process*, USAC, <http://www.usac.org/sl/applicants/step02/competitive-bidding.aspx> (viewed Sept. 15, 2013). The Commission also has recognized the “cost savings resulting from the RFP process.” *Rural Health Care Support Mechanism*, Report and Order, 27 FCC Rcd 16678, ¶ 236 (2012).

Commission should provide samples and/or checklists for schools to use in developing RFPs.

The types of information that such materials should include are outlined in Appendix C.

## **B. Easing Administrative and Regulatory Burdens**

There is widespread agreement that the current E-rate process is unnecessarily complex and that efforts to simplify the program would benefit participants by reducing ongoing uncertainty regarding the program rules and funding.<sup>67</sup> Toward this end, there are several measures that the Commission should adopt to ease the administrative and regulatory burdens the current E-rate regime imposes on program participants.

### **1. Administrative Burdens**

The Commission notes that “[a]pplicants for E-rate funds are required to complete approximately six FCC forms over the course of a funding year” and also may need to respond to questions from USAC and requests for additional information.<sup>68</sup> This process can be streamlined

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<sup>67</sup> See, e.g., Clyburn Column (“we need to ensure the administrative efficiency of the program”); National Broadband Plan at 238, § 11.19; NPRM, Statement of Commissioner Ajit Pai (“The application process is too complicated for schools and libraries. Some give up and don’t bother to apply; others apply but get tangled in red tape and don’t receive their money until years later.”); Rosenworcel Statement (“I can tell you from my experiences speaking about E-Rate during the last several months that nothing gets applause like the promise of simplifying the process. I hope we can take a fresh look at how the complexity of our existing system can deter small and rural schools from applying.”); Comments of Bangor Union Elementary School District, WC Docket No. 13-184, at 1 (Aug. 28, 2013) (“We need consistent, clear funding timelines and decisions so that we can plan.”); Letter from Charles Eberle, Attorney-Adviser, Telecommunications Access Policy Division, Wireline Competition Bureau, to Marlene H. Dortch, FCC Secretary, WC Docket No. 13-184, at 3 (Aug. 16, 2013) (Jesse Peavy, Director of Technology for the Bleckley County schools explains that “it is important for USAC to streamline the E-rate application approval process so that school districts can have more certainty.”).

<sup>68</sup> NPRM ¶ 224. See also, e.g., AASA/AESA Comments at 3 (“School districts and LEAs navigate one-half dozen forms in completing the E-Rate application process each year. This annual paper trail absorbs countless hours[.]”); Comments of the Merced River School District, WC Docket No. 13-184, at 1 (Aug. 28, 2013) (“The need to streamline the application process is

significantly in ways that should both reduce the administrative burdens of the current system and speed the disbursement of E-rate funds. For example, if multi-year funding were permitted, there simply would be no need for the annual filing of each form.<sup>69</sup> In particular, schools would no longer have to file FCC Form 471 each year and face ongoing uncertainty regarding funding availability. As schools have noted, “[o]ne of the simplest, and yet extremely helpful rule changes, would be to allow the Form 471 to be filed once for multi-year contracts[.]”<sup>70</sup>

In addition, the Commission should adopt its proposal to “revise the Item 21 attachment to the FCC Form 471 to collect data more consistently from all applicants.”<sup>71</sup> Each FCC Form 471 application must include a description of the products and services for which discounts are being sought, which is known as an Item 21 Attachment. Frequently, USAC will receive a completed FCC Form 471 and then, shortly thereafter, seek additional information regarding products and services that already was submitted as part of the Item 21 Attachment. This process imposes an unwarranted administrative burden on schools and significantly delays funding decisions. If the Commission modifies the attachment to ensure that the necessary data is submitted as part of the application process, USAC should no longer need to issue an additional request for information with the Form 471 Receipt Acknowledgment Letter unless

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crucial. It is especially in need of streamlining for small and rural districts who lack the personnel to address the process and application requirements.”); Comments of North Boone Community Unit School District 200, WC Docket No. 13-184, at 1 (Aug. 28, 2013, filed Aug. 29, 2013) (“Making the E-Rate application process easier is a huge step in the right direction.”).

<sup>69</sup> See discussion *infra* at Section V.

<sup>70</sup> Comments of the Wisconsin Department of Public Instruction, GN Docket No. 09-51, at 5 (Nov. 20, 2009).

<sup>71</sup> NPRM ¶ 53.

there are discrepancies between the information contained in the FCC Form 471 and the Item 21 Attachment.<sup>72</sup>

## 2. Regulatory Burdens

In addition to easing the burdens associated with the current filing processes, the Commission also can reduce the burdens imposed on E-rate providers and participants by maximizing regulatory certainty. In particular, the Commission should provide greater certainty to program participants by promptly acting on requests for clarification – both those that are currently pending and those that may be filed in the future.

For example, the Commission’s Lowest Corresponding Price (“LCP”) rule, which prohibits providers from charging E-rate customers a price above the lowest price that the service provider charges to similarly-situated non-residential customers for similar services,<sup>73</sup> has been a source of ongoing confusion and uncertainty for several years. The United States Telecom Association and CTIA – The Wireless Association filed a petition asking the FCC to clarify several aspects of the LCP obligation over three years ago.<sup>74</sup> In addition to addressing this petition, the Commission should provide further clarity by addressing other issues, including the relationship between the LCP rule and the FCC’s capital amortization requirements,<sup>75</sup> the

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<sup>72</sup> See *id.* ¶ 233 n.295.

<sup>73</sup> 47 C.F.R. §§ 54.500(f); 54.511(b).

<sup>74</sup> Petition of United States Telecom Association and CTIA – The Wireless Association® for Declaratory Ruling Clarifying Certain Aspects of the “Lowest Corresponding Price” Obligation of the Schools and Libraries Universal Service Program, WC Docket No. 02-6 (Mar. 19, 2010).

<sup>75</sup> For example, although USAC permits, and in some instances requires, that certain capital expenditures be amortized over a multi-year period, it is unclear how those amortized capital expenditures should be treated for purposes of the LCP rule. See *Item 21 Attachments*, USAC, <http://www.usac.org/sl/applicants/step04/item-21.aspx> (viewed Sept. 15, 2013) (“For projects

treatment of promotional rates for purposes of the LCP requirement,<sup>76</sup> and how providers should determine adherence with the “look-back” provision, which establishes a rebuttable presumption that rates offered within the previous three years are compensatory.<sup>77</sup> Although these issues have not been raised in previous petitions, they are a source of confusion for E-rate providers, and any additional clarity the Commission can provide will ease the burden on E-rate participants and providers by eliminating a substantial source of regulatory uncertainty.<sup>78</sup>

**V. THE COMMISSION SHOULD IMPLEMENT MEASURES THAT WILL MAXIMIZE THE COST-EFFECTIVENESS OF E-RATE EXPENDITURES**

As the Commission correctly notes in the NPRM, “[e]nsuring that schools and libraries spend E-rate money in the most cost-effective ways possible maximizes the impact of limited E-rate funds and helps ensure that all eligible schools and libraries are able to receive all the

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that have service provider infrastructure with up-front capital costs greater than \$500,000, the initial capital costs must be amortized over at least a three-year period.”); *Wide Area Networks (WANs)*, USAC, <http://www.usac.org/sl/applicants/beforeyoubegin/eligible-services/wan.aspx> (viewed Sept. 15, 2013) (“Applicants may not seek to recover more than one-third of the total non-recurring charges in any one funding year if they are \$500,000 or more.”).

<sup>76</sup> Although the FCC’s rules state that promotional rates offered by a service provider for a period of more than 90 days “must be included among the comparable rates upon which the lowest corresponding price is determined,” it is unclear whether the 90 days refers to the period of time that the promotion must run or the period of time the rate remains in effect. 47 C.F.R. § 54.511(b). For example, if a carrier runs a promotion offering a discounted rate for the first 60 days of service to customers that sign up during a 120-day window, would that discounted rate have to be included in that carrier’s LCP analysis even though the promotional rate was only in effect for 60 days? Conversely, if a provider ran a promotion offering a year-long discounted rate to any customer that signed up for service during a 30-day window, would that rate be relevant to the LCP analysis even though the promotion only ran for 30 days?

<sup>77</sup> First Report and Order ¶ 489. Service providers currently determine their adherence with this provision using varying methods. Clarifying the way in which the Commission intends for this presumption to be applied would ensure that the LCP rule is applied consistently and in a manner that benefits schools and the E-rate program.

<sup>78</sup> *Cf.* NPRM ¶ 210 (inviting commenters to refresh the record on whether the FCC should clarify the scope and meaning of the LCP rule).

support they need.”<sup>79</sup> Indeed, the Commission “has a responsibility to ensure [that funds] are spent effectively,”<sup>80</sup> particularly in light of the statutory requirement to ensure that its efforts to provide schools and libraries with access to advanced telecommunications and information services are “economically reasonable.”<sup>81</sup> The fact that USF is financed by U.S. consumers underscores the importance of that responsibility and the Commission’s duty to ensure that the Fund taken as a whole does not impose an unreasonable burden on consumers. There are several measures the Commission could adopt that would advance this important goal.

As discussed above, Comcast’s experience in delivering high-speed data services to schools demonstrates that properly tailoring E-rate-supported services to a school’s particular requirements increases the cost-effectiveness of the program and actually could reduce the demand on the Fund in many cases. Moreover, allowing schools to receive funding for the services they need, whether currently classified as priority one or priority two services, will increase the overall cost-effectiveness of E-rate purchases, as will allowing schools to receive funding for optimization services that help to maximize the utility and longevity of lower-cost broadband connections. Providing schools with sufficient tools to help them identify the most cost-effective purchasing option that can fulfill their particular broadband requirements also will aid in ensuring that expenditures are economically reasonable. In addition, the Commission

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<sup>79</sup> *Id.* ¶ 41. *See also, e.g.*, Clyburn Column (“We must maximize the cost effectiveness of purchases made using E-Rate support to ensure that we are meeting our broadband goals at the lowest possible cost.”); National Broadband Plan at 238 (“The FCC should work to make overall broadband-related expenses more cost-efficient within the E-rate program.”).

<sup>80</sup> NPRM ¶ 41.

<sup>81</sup> 47 U.S.C. § 254(h)(2).

should adopt several other policies focused on promoting fiscally responsible network planning and eliminating waste, fraud, and abuse.

*First*, the Commission should ensure that any policies adopted in this proceeding to promote cost-effective spending build upon the Commission’s “primary factor” requirement. This rule requires that, while “[a]pplicants may . . . take other factors into consideration, . . . in selecting the winning bid, price must be given more weight than any other single factor.”<sup>82</sup> As the Commission has recognized, requiring price to be the most important consideration in comparing bids is a “rational, reasonable, and justified requirement that will maximize the benefits of the E-rate discount mechanism, while limiting waste, fraud, and abuse.”<sup>83</sup>

Further, although in most cases schools and libraries likely will be able to determine the low bidder by comparing prices for similar products, in some circumstances it will be important for them to consider both the total costs of competing bids and significant differences in performance capabilities (*e.g.*, transmission speed). For example, a bid to provide dark fiber in response to an RFP initially may appear to be a lower-priced alternative to leasing fiber service from an experienced provider. As the Commission has recognized, however, that simple comparison ignores the substantial additional costs that a school or library would incur in order to activate, manage, and maintain dark fiber.<sup>84</sup> Consequently, with certain exceptions,

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<sup>82</sup> *Request for Review of the Decision of the Universal Service Administrator by Ysleta Independent School District*, Order, 18 FCC Rcd 26407, ¶ 50 (2003).

<sup>83</sup> *Id.*

<sup>84</sup> *See, e.g.*, Sixth Report and Order ¶ 18 (emphasizing that “[p]roviding services using dark fiber may involve a number of additional costs beyond lease payments for fiber connectivity, and those costs should be factored in to a total-cost comparison across bids.”).

purchasing an active fiber service is likely to be more cost-effective than financing the installation of dark fiber. Total cost analysis is, therefore, essential.

*Second*, the Commission should allow applicants to enter into contracts up to five years in length and, consistent with any statutory constraints, should provide greater certainty to program participants by allowing them to receive up-front E-rate funding commitments to cover the full term of such contracts.<sup>85</sup> Extending the permissible contract length to five years is consistent with the “typical terms for comparable enterprise services in broader business broadband markets.”<sup>86</sup> Today, commercial businesses investing in new fiber typically enter into multi-year service contracts of at least five years in length to take advantage of the financial benefits of such longer-term arrangements (*e.g.*, the ability to amortize capital expenditures over an extended period of time). E-rate customers should be permitted to take advantage of similar efficiencies,<sup>87</sup> because the deployment of a high-speed broadband network within a school will require significant up-front capital investments. Lengthening the term of the contract and, hence, the period over which such capital investments can be recovered would ease the financial burden on the Fund as well as on the schools that must contribute their own resources. As the Commission aptly notes, “where significant new fiber builds are involved, long term contracts could be critical to keeping recurring costs low.”<sup>88</sup> The Commission, thus, should extend the maximum contract term for E-rate services to five years.

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<sup>85</sup> NPRM ¶¶ 242-246.

<sup>86</sup> *Id.* ¶ 243.

<sup>87</sup> *Id.* ¶ 240 (noting that multi-year contracts can drive down service costs, provide more certainty, and minimize duplicative review by USAC).

<sup>88</sup> *Id.* ¶ 244.

Customers that enter into multi-year agreements with vendors for E-rate services also should be able to receive multi-year funding commitments from USAC. The current rule requiring applicants to seek funding on a year-by-year basis inherently creates uncertainty, as schools and libraries have no guarantee that they will receive funding for the latter years of multi-year contracts. As a result, although the commercial marketplace for fiber services demonstrates that such contracts may be the most efficient approach, applicants may be reluctant to enter into multi-year deals. Providing schools and libraries multi-year funding commitments that match the terms of their E-Rate contracts also would advance the Commission's goals by promoting long-term planning and ensuring that E-rate recipients enter into the agreements that are best suited to meet their needs. Finally, multi-year funding commitments would reduce the administrative burden imposed on applicants and simplify the application process. For example, if multi-year funding were permitted, schools should be able to "file a single FCC Form 471 application for the funding year in which the contract commences and go through the full review process just one time for each such multi-year contract."<sup>89</sup>

*Third*, the Commission should encourage USAC to use audits and other measures to ensure that funding requests are reasonable and tailored to a school's needs. While these measures must be carried out in a way that does not significantly delay the funding process or create undue administrative burdens, any application for funding that contains projected expenditures that far exceed the typical budget submitted by similarly-situated schools should be more carefully reviewed to ensure that the proposed expenses are reasonable and do not represent an attempt to "gold-plate" a network through unwarranted or inefficient upgrades.

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<sup>89</sup> *Id.* ¶ 241.

Notably, this type of review process would further the Commission’s goal of “reconcil[ing] the need to simplify the program with the need to protect against waste, fraud, and abuse.”<sup>90</sup>

## VI. CONCLUSION

The Commission should adopt a comprehensive plan for modernizing the E-rate program, consistent with the foregoing proposals, that will accelerate the deployment of advanced broadband networks that are capable of supporting 21st century learning tools to elementary and secondary school classrooms and libraries.

Respectfully submitted,

*/s/ Kathryn A. Zachem*

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<sup>90</sup> *Id.* ¶ 46.

## APPENDIX A

### Potential Questions for Inclusion in Digital Template Software

#### **(1) Site Information (to be provided for each site)**

- Location
- Number of buildings
- Number of floors in each building
- Type of school (*e.g.*, elementary, secondary)
- Number of classrooms and general measurements
- Building materials involved (*e.g.*, cinder block, concrete, wood)
- Existing infrastructure (*e.g.*, whether all classrooms are wired, whether Wi-Fi capability currently is in place)
- Whether asbestos is present and, if so, whether an abatement policy is in place
- Power infrastructure (*e.g.*, whether a backup power system is in place)
- Current network topology (*e.g.*, star, full mesh, half mesh) (To the extent that the party entering the data is unable to determine the network topology, the software should be capable of determining the school's topology based on other data input into the software.)

#### **(2) End Users**

- Total number of end users
- Number of end users at each site
- Number of students per classroom
- Typical services and applications used
- Whether end users currently have access to a Local Area Network or WAN

#### **(3) Servers and Services Needed**

- Host location(s)
- Level of distribution required (*e.g.*, inter-networking needs – which sites need to communicate with other sites, whether all locations require direct access)
- Type(s) of services needed
- Types of traffic (*e.g.*, unicast, multicast, broadcast)
- Security and content filtering needs

**(4) Predicted Usage**

- Predicted traffic for each segment of the network (*e.g.*, the likely usage of each WAN link)
- Foreseeable usage changes over the next five years (*e.g.*, shifts in end user population, sites, or applications to be used)

## APPENDIX B

### Information for Inclusion in RFIs

**(1) Current Infrastructure and Needs** – Schools should provide a copy of the inputs to the digital template (outlined in Appendix A) or provide as much information as possible regarding the school's current infrastructure and needs, including:

- Location
- Number of buildings and classrooms
- Building materials involved
- Total number of users
- Number of students per classroom
- Current and desired bandwidth
- Types of services needed
- Challenges the school faces today in meeting its needs

**(2) Goals and Objectives**

- A description of the school's primary goals and objectives for deploying or upgrading its network
- Proposed budget range
- Timeframes for implementation
- The outputs of the digital template (to the extent that the school wants vendor comment)

**(3) Information Sought from Potential Vendors**

- Company overview and information
- Service offerings and features
- Scalability of services
- Service levels offered (*e.g.*, the schedule for notification in advance of network changes, the number of users that can be served simultaneously)
- Ordering and billing process
- High-level terms and conditions
- Support services offered
- Costs
- Implementation timeframes and plans

## APPENDIX C

### Information for Inclusion in RFPs

**Section I** *The school's current infrastructure and technology environment.* At this final juncture in the network design process, it is important that the school provide all readily available information regarding its current infrastructure. Ideally, this information would include:

- (a) A complete copy of the school's digital template inputs;
- (b) A narrative description of the infrastructure and technology environment at each individual site; and
- (c) A current high-level diagram of the network currently in place.

**Section II** *The school's goals and objectives.* In this section, the school should:

- (a) Describe its basic reasons for seeking to update its network;
- (b) Outline the manner in which its network is used today and describe in detail how it would like to use a modernized network (*e.g.*, applications it wishes for students to use, whether it plans to adopt a "bring your own device" policy);
- (c) Define a budget; and
- (d) Establish a firm timeframe for implementing network updates.

**Section III** *The scope of work requested and the applicable specifications and requirements.* The school should provide as much information as possible regarding the school's particular needs. For example, the school may wish to seek proposals only from those technology vendors that can:

- (a) Meet specified capacity requirements (*e.g.*, port and bandwidth speeds);
- (b) Meet connectivity requirements (*e.g.*, link specified network elements to one another and carry a certain level of traffic over those links);
- (c) Provide services that readily can accommodate future growth (*i.e.*, scalable services);
- (d) Provide a specified level of service (*e.g.*, meet quality of service requirements, service availability specifications, response and restoration performance metrics); and/or
- (e) Fulfill certain security needs.

**Section IV** *An overview of the proposed product/service.* Having received input through the RFI process regarding the available technology solutions, the school should be well-positioned to seek bids on the specific products and/or services that meet its needs. In particular, the school should request that all bidders include:

- (a) Detailed information regarding the products and services it would provide to the school;
- (b) Network diagrams outlining how the technology vendor would configure the school's network using its products and services; and
- (c) Information regarding how the vendor would provision its products and services (*e.g.*, project plan milestones).

**Section V** *Necessary support and maintenance functions.* The school should outline its requirements in the following areas and request that all proposals address how the potential provider could efficiently fulfill these needs:

- (a) Account management;
- (b) Customer service; and
- (c) Network operations.

**Certificate of Service**

I hereby certify that on this 16<sup>th</sup> day of September, 2013, I caused a true and correct copy of the foregoing Comments of Comcast Corporation to be mailed by electronic mail to:

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