

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

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

**COMMENTS OF THE QUILT**

September 16, 2013

## Executive Summary

The Quilt believes it is important to set national broadband capacity goals for our country's schools and libraries to emphasize the importance of affordable broadband access in preparing students to compete in a 21<sup>st</sup> century global environment. Based on the experience of the Research and Education Networks (R&E Networks), the key to putting schools and libraries on a sensible path toward these goals is to invest in scalable infrastructure that is able to expand in a cost-effective way to match the demand for higher capacity broadband connections over time by individual schools and libraries.

The Quilt appreciates and supports the FCC's efforts to equalize the treatment of "dark" and "lit" fiber. By denying E-rate support for construction costs and the electronics used for dark fiber, the current E-rate rules skew the marketplace in favor of lit fiber, even when dark fiber may be the better option.

It is not enough that there is a high capacity connection to the edge of the school network. This type of bandwidth must be accessible in the classroom where instruction and learning occurs. The Quilt believes that a modernized E-rate program should recognize the importance of internal connections through committed, recurring program funds.

As bandwidth utilization by schools and libraries continues to grow, The Quilt recognizes there are unmet needs of schools and libraries based on current E-rate program funds. The transition of the program to support more digital services only compounds the current demand on program funds. With a successful history of cost-effectively serving the K-12 and library communities, the R&E Networks offer our insights into how program funds can be utilized more efficiently.

The Quilt rejects the view that aggregating applicants can diminish competition. Our members have found the opposite to be true. The knowledge, experience and relationships held by consortium applications such as the R&E Networking community promotes partnerships with a range of service providers and results in lower pricing to schools and libraries. It also allows access to higher priority technical support for individual schools and libraries than they would have as an individual connector. Finally, aggregating allows access to last mile technologies that allow connectors to flexibly grow into higher bandwidth commitments efficiently and economically.

Multi-year contracts offer significant cost savings and should be encouraged because of their administrative efficiencies. Multi-year contracts should be given "evergreen" status

once they have been approved. Approved funding for Priority 1 broadband services should not be held up because of a subsequent application for Priority 2 funding.

The Commission and USAC should take several steps to expedite the processing of consortia applications, such as providing dedicated staff to process these applications, providing training to consortia applicants, updating the portal, and implementing an open application deadline.

The Quilt opposes adoption of a bright line rule that would impose limits on the amount of discounts available in the situation of single bid because it would penalize already disadvantaged schools and libraries.

In order to provide the most options to schools and libraries and lessen the administrative burden for application processing, the requirements that applicants must define the application category should be eliminated.

E-rate reform must address home connectivity for underserved students in some tangible way. Building upon the FCC's extended school hour program and allowing a strategy where the school or library becomes an after-hours hot spot by inviting a commercial provider to share the school's E-rate funded infrastructure are two possible strategies.



While all members of The Quilt are non-profit organizations, they are funded, governed and structured very differently. These differences reflect the diverse and complex environments of the communities and states in which they operate:

- 34% of Quilt members are 501(c)(3) non-profit corporations;
- 40% of Quilt members are university-based organizations;
- 26% of Quilt members are either a division of the State Board of Regents, State Dept. of Higher Education or another State Government agency.

R&E Networks have several core competencies which allow them to provide high-value services to schools and libraries, such as:

- Most R&E Networks own and control their own middle-mile and some last mile network infrastructure. This allows R&E Networks to respond to the unique requirements of community anchor institutions (CAIs) and support the sustained increases in bandwidth utilization by these institutions over time.
- As consortium purchasers, R&E Networks have a successful history of forming lasting public/private partnerships with commercial telecommunications carriers and other industry partners. These partnerships have resulted in the ability for schools, libraries and other CAIs to cost-effectively access R&E Networks' shared infrastructure while increasing revenue and lowering administrative costs for these commercial partners. (The benefit of aggregation and consortium purchasing was specifically recognized in the National Broadband Plan, p. 154, which is copied in Appendix A of these comments). The positives of consortium purchases extend into technical support where consortium buyers often receive higher priority in technical support. Consortium buyers often obtain access to flexibly priced last mile circuits that allow connectors to grow into higher bandwidth commitments in an economical and efficient fashion (see page 7 paragraph 1d).
- R&E Networks have been designed to meet the needs of some of the most demanding Internet users in the country -- scientists, academics and researchers in our nation's leading academic institutions. These networks are engineered to support high-quality services that are consistent regardless of the number of users on the network. The networks must readily adapt to new experiments or projects that place new demands on the network. The network speed, quality, flexibility and support offered by R&E Networks also provide schools and libraries with exceptional service that adapts easily to specific demands of these users.

- Many of these R&E Networks received BTOP grant funding to build out middle mile infrastructure, upgrade broadband connections and add new connections to community anchor institutions in their states. These projects resulted in lower costs and increased capacity to K-12 schools and libraries and other community anchor institutions that previously did not have such broadband access at affordable prices.

## **B. Policy Recommendations from The Quilt**

The following discussion provides the views of The Quilt and its membership on several of the questions raised by the E-rate NPRM:

### **1. Paragraphs 22-28: Bandwidth targets (connectivity metrics) for schools and libraries**

The Quilt believes it is important to set national broadband capacity goals for our country's schools and libraries to emphasize the importance of affordable broadband access in preparing students to compete in a 21<sup>st</sup> century global environment. Based on the experience of the R&E Networks, the key to putting schools and libraries on a sensible path toward these goals is to invest in scalable infrastructure that is able to expand in a cost-effective way to match the demand for higher capacity broadband connections over time by individual schools and libraries.

Capacity requirements will undoubtedly grow for each school and library over time as our national goal pushes toward ever higher capacities in the future. Where utilization data and financial analysis support it, fiber optic solutions are most likely to offer the best long-run approach because fiber networks can be upgraded to add additional capacity in the future simply by changing the electronics. To determine where school or library ownership of fiber is a feasible alternative, a return on investment calculation showing how the capital investment ameliorates annual bandwidth costs should be part of the analysis. Several Quilt members use a 3-5 year return on investment (ROI) on fiber builds to justify the capital investment. Within this timeframe, upfront capital investments for fiber will allow E-rate dollars to go further as future operational costs will be lower for these schools and libraries once the fiber is deployed.

The Quilt offers in the Appendix B three examples of projects that provided significant cost savings to schools in Michigan and North Carolina. These projects demonstrate the value of extending cost-effective fiber solutions, including in rural areas.

The Quilt offers a few additional points of clarification regarding these benchmarks:

- a. The E-rate program should not pick winners and losers among technologies arbitrarily. Applicants should have the flexibility to use the best and most cost-effective technology for each location. Several R&E Networks have successfully deployed wireless (microwave) solutions, and there are some high-cost areas where it will never be economically feasible to provide fiber to a school or library (especially if the school/library is small and far away from an access point).
- b. While the capacity of the connection is important in achieving the goals of digital learning, the quality of the connection is just as important to achieving our broadband goals for schools and libraries. Schools and libraries need reliable, dedicated connections in order to utilize learning applications. Not only is network uptime critical, but also symmetrical connections (same speed up/down), full committed information rates, low network latency (the amount of time required for a data packet to get from point A to point B) and jitter (variability in the timing of data packet arrival). These are all vital to supporting e-Learning initiatives such as distance learning, videoconferencing, and on-line testing. Quality of service is important for schools and libraries to consider when evaluating the value of a broadband connection.
- c. The E-rate program should place a value on provider services that can support fluctuations or spikes in network usage, such as those around standard testing intervals for K-12 schools, without requiring schools and libraries to over-provision connectivity to meet the specific requirements of these flash events. Through effective aggregation and management, providers can work with schools to recognize when increased network use over time requires bandwidth upgrades. The E-rate program should incent providers to raise circuit commitments in a cost-effective, incremental fashion as schools and libraries demonstrate the demand for it. This will allow E-rate program dollars to go further and support sustained increases in bandwidth demand by schools and libraries over time as it is needed.

## **2. Paragraphs 70-78: Equalizing the Treatment of Dark and Lit Fiber**

Quilt members have been strong supporters of the E-rate program. The FCC's 2010 decision<sup>4</sup> to allow fiber-based services provided by non-telecommunications carriers to be E-

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<sup>4</sup> In the Matter of Schools and Libraries Universal Service Support Mechanism, CC Docket No. 02-6, A National Broadband Plan For Our Future, GN Docket No 09-51, Sixth Report and Order, FCC 10-175, 25 FCC Rcd 18762. ("2010 E-rate Reform Order"), released Sept. 28, 2010.

rate eligible has allowed R&E Networks to expand the scope of services they provide to eligible schools and libraries. Fiber, and especially dark fiber services, can offer several important long-term advantages, such as:

- a. R&E Networks have been able to construct/build fiber laterals directly to schools and libraries, which has allowed them to lower their rates and provide more affordable broadband services than provided by the traditional commercial companies.
- b. Additionally, the competition from non-telecommunications providers has created marketplace pressure on traditional telecommunications service providers to offer affordable Ethernet service solutions to schools and libraries where traditionally only TDM services such as T1s and T3s were offered.
- c. The availability of fiber to schools and libraries with open interconnection helps to drive down the costs of last mile connections for other telecommunications providers so that they can expand their last mile services to surrounding residential and business consumers.

Where schools and libraries have the opportunity to own fiber (i.e. dark fiber), it insulates these sites against future budgetary constraints for program funding or marketplace fluctuations in pricing. We are pleased that the Eligible Services List specifically recognizes that certain fiber-based expenses provided by non-telecommunications carriers are E-rate eligible for E-rate support. However, in order for schools and libraries to receive the maximum benefit from dark fiber deployment, we suggest treating lit and dark fiber in similar way by offering no distinction between their eligible costs. For example, special construction charges for dark fiber as well as the modulating electronics necessary to light dark fiber should be eligible program costs as they are for a leased lit fiber option. This will provide more options for schools and libraries by making dark fiber a more cost effective solution. In addition, to determine where school or library ownership of fiber is a feasible alternative, a return on investment calculation showing how the capital investment ameliorates annual bandwidth costs should be part of the analysis. Several Quilt members use a 3-5 year ROI on fiber builds to justify the capital investment.

The Quilt community also recommends removing the current limitation on initial capital costs of on-premise Priority 1 equipment to help promote use of fiber as an E-rate eligible service. Under today's program, service providers are limited in their ability to recoup the initial costs of construction or installation. Such upfront reimbursements must be limited to less than 67 percent of total charges. This 67 percent limit is evaluated by dividing the initial capital costs by all charges of the service over the funding year, subject to these further criteria: Initial capital costs include costs for equipment and its installation, but not costs for maintenance.

We recommend that USAC should review initial capital outlay costs of on-premise Priority 1 equipment as part of the overall evaluation of the most cost effective solution for an institution without additional restrictions such as limited reimbursements up to 67% of initial charges over the funding year.

### **3. Paragraphs 83-87: Options to Enhance Broadband Connectivity Within the School or Library Building**

The Quilt supports prioritizing funding that not only provides on-going support for broadband connections and Internet access to the school or library building, but also provides regular, recurring funding for connections inside the building and into the classroom. It is not enough that the capacity of school connections outside the building supports digital learning initiatives such as distance learning and virtual field trips, but that the technology is accessible in the classroom where the instruction and learning occur. If the program strives to obtain high capacity connections to each school building, but does not provide funding for new equipment inside the building to use the high-bandwidth connectivity, then the benefit of the capacity investment goes unfulfilled.

As connections to buildings are upgraded to meet current needs, this capacity must be dispersed throughout the building into the classrooms. Currently, students and educators have an incentive to use cell phone service in the classroom because support is available for this service under Priority 1, which is unfortunate because cellphone service is a costly solution and drives up the demand for current Priority 1 funds. Prioritizing funding for internal connections into the classroom would allow for the purchase of more cost-effective solutions such as Wi-Fi. Therefore, The Quilt supports a specific allocation of funding for internal connections inside the school or library building.

### **4. Paragraphs 172-176: Funding**

As bandwidth utilization by schools and libraries continues to grow, The Quilt recognizes there are unmet needs of schools and libraries based on current E-rate program funds. The transition of the program to support more digital services only compounds the current demand on program funds. With a successful history of cost-effectively serving the K-12 and library communities, the R&E Networks offer our insights into how program funds can be utilized more efficiently to go further.

Once fiber is available to these sites, on-going operational costs requested by these schools and libraries for broadband connections will decrease over time. If program funding for upgrades is accelerated, the R&E Network community stands ready to apply for and initiate

fiber projects. With many years of experience managing fiber acquisition and deployment and supporting schools and libraries, R&E Networks are well-positioned to coordinate fiber builds and to leverage public-private partnerships.

## **5. Paragraphs 179-185: Increasing Consortium Purchasing**

In Paragraph 185, the Commission asks for comment on whether the use of consortia could diminish competition by reducing the number of bidders. Our experience as consortium applicants runs counter to the view that aggregating applicants can diminish competition. The knowledge, experience and relationships held by consortium applications such as the R&E Networking community promotes partnerships with a range of service providers and results in lower pricing to schools and libraries than they would be able to negotiate independently. The opportunity for a larger volume, multi-site contract which lowers administrative costs for the provider is frequently the incentive for providers to bid on more of the individual sites of a consortium application rather than just a single opportunity. Based on a site-by-site evaluation of responses, consortia determine the best technology and value for the particular site and in doing so, award contracts to multiple vendors.

The benefits of consortium purchases extend into technical support where consortium buyers often get higher priority in technical support. Consortium buyers often obtain access to flexibly priced last mile circuits that allow connectors to grow into higher bandwidth commitments in an economical and efficient fashion.

## **6. Paragraphs 239-246: Multi-Year Contracts**

The Commission raises several issues regarding the treatment of multi-year contracts. The R&E Network community is very familiar with multi-year contracts; multi-year contracts are standard operating procedure for many R&E Networks. We believe multi-year contracts offer significant cost savings and should be encouraged because of the administrative efficiencies as well. Unfortunately, the current E-rate application process is not conducive to multi-year contracts. Members of the Quilt often find that multi-year contracts are processed more slowly than other applications. The Quilt thus offers the following suggestions to expedite the treatment of multi-year contracts:

- a. The Commission should adopt an “Evergreen Status” process for the life of the contract similar to the Healthcare Connect Fund program. Multi-year contracts should be subject to a rigorous review in year 1 with automatic sign-off on subsequent years barring any administrative or technical changes in requests.

Such streamlined review should not be limited to 3 year contracts as proposed by the FCC. A lengthier contract, such as 5 years, is especially common when the cost of service or construction is high (in the case of fiber). When operating expenses (OPEX) must remain the same, these costs must be spread across multiple years in order to demonstrate cost-effectiveness and yield return on investment. Streamlined review of contracts up to 5 years long could be especially useful to encourage build-out to rural areas.

- b. Once funding for broadband connections is approved for a multi-year contract, that funding should continue through the life of the contract, even if an additional request is made in a subsequent year to support an internal connection to a classroom. The Quilt membership has encountered some circumstances in which funding for the original broadband connection was held up because of a separate request for Priority 2 support. Priority 1 funding under a multi-year contract that has already been approved should not be frozen because a subsequent Priority 2 funding application was submitted.

## **7. Improve Consortium Application Process**

The approval process for consortium applications (that include a mix of schools and libraries) is very lengthy. Frequently, consortium filers wait a year for a response to an application. In these situations, consortium members must make the decision whether or not to shoulder the risk of paying bills to their telecommunications provider in-full while waiting on a response to their application. Many schools and libraries are not able to assume this risk and are thus discouraged from participating in the E-rate process.

There are several steps that the FCC can take to improve the timeliness of reviewing consortia applications, such as:

- a. Designate dedicated reviewers for consortia applications to be reviewed on an on-going basis as applications are filed in order to support the July 1<sup>st</sup> notification date;
- b. Minimize verification of site information and utilize on-line search tools such as school websites, mass email lists, etc. to facilitate site verification;
- c. Encourage USAC to continue work on an upgraded portal which provides more active status notification to both consortia as well as service providers;
- d. Provide targeted training for consortium filers;

- e. Support allowing invoices to be submitted as proof of payment to streamline the process after the first year where there has been a thorough review of the contract; (See Paragraph 160)
- f. Streamline the Letter of Authorization process between individual schools and libraries and consortia filers by extending renewals to five years;
- g. Adopt an open application deadline process similar to the Healthcare Connect Fund. This would allow for applicants to be able to consider the most cost-effective technology solution to meet needs and not just the option that will allow them to meet the fixed deadline. This is particularly helpful for fiber applicants that require more extensive up-front planning for fiber.

## **8. Paragraphs 203-208 – Competitive Bidding Process**

The Quilt appreciates the Commission's desire to improve the competitive bidding process and to ensure that schools and libraries are able to obtain the lowest rate possible. But the proposal (in paragraph 203) to adopt a bright line rule that would impose limits on the amount of discounts available in the situation of a single bid would be counterproductive. This would be an additional penalty to the school or library that is already disadvantaged in its ability to receive affordable, adequate broadband access. In cases where a school or library receives no bids or only a single bid, the Commission should consider providing sufficient funding to give an extra incentive to a provider to deploy fiber (or, if fiber is not feasible, some other technology) to ensure that the school or library has the broadband capability it needs.

## **9. Paragraph 250: Eliminating the Regulatory Categories.**

The FCC seeks comment on eliminating the requirement that applicants must identify the category of service they are seeking in the 470/471 forms. The FCC notes that applicants are eligible to receive E-rate services from either common carriers or non-common carriers. In the *Healthcare Connect Fund Order*, the Commission also allowed health care providers to choose from a wide range of connectivity solutions using any technology from any provider.<sup>5</sup>

The Quilt agrees with these ideas for the same reasons noted in its reply comments on the Eligible Services List in 2012. Requiring applicants to identify in advance the regulatory classification is not meaningful to most applicants and provides an added layer of complexity to

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<sup>5</sup> *Healthcare Connect Fund Order*, 27 FCC Rcd at 16729-30, para. 111.

the program rules that could result in unintentional mistakes and denials of funding. Giving schools and libraries more competitive options will make more efficient use of the limited E-rate funds and will allow the program to serve a greater number of schools and libraries. Therefore, the Quilt supports eliminating the regulatory categories with respect to the forms required for E-rate supported services.

#### **10. Paragraphs 319-323: Community Hot Spots**

Education does not end at when school is out for the day. E-rate reform must address home connectivity for underserved students in some tangible way. Building upon the FCC's extended school hour program (the "Learning on the Go" or "E-rate Deployed Ubiquitously (EDU) program"), the FCC should consider allowing a strategy where the school or library can become an after-hours hot spot. Further, the program should allow the school/library to invite a provider to share the school's E-rate funded infrastructure to deploy wireless Internet access service to the surrounding community.

#### **C. Conclusion**

Serving the unique bandwidth requirements of higher education, K-12 schools, libraries and other community anchor institutions is the common mission of our country's Research and Education Networks. By charter, Research and Education Networks aim to accomplish many of the same broadband goals that are contained in the President's ConnectED Initiative and that are set forth in this proceeding. Adopting the changes recommended above will go a long way toward providing schools and libraries the broadband capabilities they need to equip students with the technological skills that they need in the 21<sup>st</sup> Century.



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The Quilt

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**APPENDIX A**  
**EXCERPT FROM PAGE 154 OF**  
**“CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN”**

Because broadband networks—particularly fiber optic networks—demonstrate large economies of scale, bulk purchasing arrangements for forms of connectivity like second-mile and middle-mile access can drive down the per-megabit cost of such access considerably. As a result, policy restrictions that impede the ability of school networks funded by E-rate to share capacity with hospitals funded by the Rural Health Care program, or the public safety system which may be funded by state and other federal sources, drive up the cost of connectivity for those institutions and for others in the community.<sup>145</sup>

At least 30 states have established state networks operated by public agencies or the private sector to aggregate demand among schools, universities, libraries, and state and local government agencies to reduce costs.<sup>146</sup> Better collaboration among government agencies could reduce the potential for waste of federal resources and maximize available federal funding for broadband-related community development projects. Federal and state policy should not preclude or limit networks that serve one category of institution from serving other institutions and the community as a whole.<sup>147</sup> The FCC should explore creative solutions to help schools, libraries and health care providers reduce their broadband-related costs by aggregating demand with other community institutions so that they can purchase the maximum amount of broadband with their USF dollars. For instance, the FCC should remove barriers to the shared use of state, regional, Tribal, and local networks by schools, libraries and health care providers when such networks provide the most cost-efficient choice for meeting broadband needs.

## APPENDIX B

Provided below are examples from Michigan and the State's R&E Network, Merit Network, as well as MCNC, which operates the North Carolina Research and Education Network. These examples highlight the savings of fiber deployments for schools and libraries.

**Example No. 1 - Rural School District**– Prior to the Merit REACH-3MC Comprehensive Community Infrastructure BTOP Project, this rural school district had a fixed capacity connection to its local Intermediate School District (ISD), which was not able to be upgraded at a price that was sustainable for the schools. The ISD was able to take advantage of the REACH-3MC backbone infrastructure and fiber-optic technologies to establish a fiber connection to the network at 1 Gbps, providing it the ability to subscribe at 150 Mbps. The ISD is planning to move more services to the cloud and has introduced a laptop & tablet program for students. Both of these initiatives would not have been possible without the fiber funded by the BTOP project.

**BTOP Success:** This school is in a rural area and without the fiber-optic infrastructure its school system would not have access to high-speed connectivity at an affordable price. Furthermore, the infrastructure and connectivity has opened up opportunities for the school system to provide improved learning and content to its students.

**E-rate Success:** The project resulted in increased capacity to school buildings up to 1 Gbps and leveraged E-rate funding to support the increased service level based on a fixed cost of \$93,897 annually for 3 years. In the 4<sup>th</sup> year, the fixed annual cost drops to \$3,750, saving the E-rate program \$90,147 annually. Additionally, because of the REACH-3MC BTOP project and the infrastructure available in the area, the school system was able to put on the ballot a millage that was approved by the citizens to help bring the 21<sup>st</sup> century network to its school system.

**Example No. 2 - Library Cooperative**– Prior to the Merit REACH-3MC Comprehensive Community Infrastructure BTOP Project, the Library Co-op in Michigan's Upper Peninsula had 2 libraries connected via fiber, and 20 libraries connected via 1 or 2 leased T1 circuits. Merit was able to connect 14 libraries to a 1 Gbps fiber. This capacity upgrade has begun to bring more interactive content opportunities to these libraries located in rural parts of Michigan's Upper Peninsula.

**BTOP Success:** The libraries are located in rural areas of the Upper Peninsula, with no cost-effective and scalable connectivity options beyond leased T1 circuits. The BTOP-funded fiber-optic infrastructure enables them to share more services over the network and bring

more interactive/video content into the libraries. The libraries also have the ability to source interactive content to other locations.

E-rate Success: The project increased capacity to each library from 1.5 Mbps or 3.0 Mbps to 1 Gbps at an ongoing fixed cost for each location. The cost per location for a 1 Gbps connection is \$3,150 annually, plus a share of the aggregated Internet bandwidth.

**Example No. 3 – North Carolina K-12 Schools** - MCNC, the non-profit operator of the North Carolina Research and Education Network, is the middle mile, transport and access provider for all 115 school districts and 60 public charter schools in North Carolina. In addition, NCREN is a super aggregator -- serving as the transport and access provider for all public universities, most private universities, all public community colleges and about 120 non-profit and public healthcare providers in North Carolina. Through the BTOP Program, MCNC has built or leased 2600 miles of middle mile fiber. MCNC also built direct lateral connections to 52 of North Carolina's 115 K-12 public school districts. These laterals serve as the "last mile" from NCREN to the District Central office and are built from the nearest NCREN Point of Presence to the district central office. The school district central office is the typical point of demarcation for the district area network.

MCNC estimates that it will save the K-12 districts in the range of \$25 million (as part of an overall \$85 million savings) in transport costs over the next 10 years because of ownership of the middle mile.

For districts where MCNC has built direct lateral connections, prices for bandwidth connecting the district demarcation point to the nearest NCREN point of presence are 33% to 66% cheaper than the next least cost alternative. The State of North Carolina E-rate Coordinator is providing specific cost summaries as part of a separate filing.