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	)	
	)	
	)	

REPLY COMMENTS OF THE URBAN LIBRARIES COUNCIL

Dated: April 21, 2014

SUMMARY

The comments submitted in response to the Public Notice confirm that the overwhelming majority of commenters either directly affirm, or do not dispute, four major premises discussed in the Urban Libraries Council's ("ULC") initial comments:

1. Libraries serve a distinctive and critical need in every American community.

2. Connectivity to and inside America's 17,000 public library buildings needs to be significantly upgraded to meet the needs of the more than 100 million adults and children who use public libraries for Internet access every year—approximately twice the number who use Internet access in K-12 schools.

3. The FCC should ascertain the difference between existing levels of connectivity and necessary levels of connectivity for each library building to determine how to close that gap for each building in the most efficient and practical manner.

4. Both the FCC and libraries need a predictable method by which the Commission can allocate funding to maximize upgraded service to library users per dollar of FCC funding and libraries can know what level of assistance to anticipate.

In these reply comments, ULC submits that by approximately June 2014, the FCC should order changes in the process by which libraries and the FCC administer funds for library connectivity. These changes should include the following:

-- requiring that all libraries seeking funding state their current outside and inside levels of connectivity, service area population, open hours, number of users at peak hours, and average income in service area based on Bureau of Labor Standards statistics;

-- providing sufficient E-Rate funds to ULC or any other stakeholder that volunteers to conduct a comprehensive, statistically representative review of existing inside and outside library building connectivity for all public libraries, with such review to be completed no later than September 15, 2014;

-- providing sufficient E-Rate funds to the same group to estimate the total cost (using the most efficient practical contracting method) for upgrading existing connections at all 17,000 public library buildings, with such estimate to be provided no later than November 15, 2014;

-- establishing a minimum 1 gigabit per second (Gbps) connection level for each library building and a 5 megabit per second (Mbps) downstream and 1 Mbps upstream Wi-Fi connectivity level for all in-building users at peak hours;

-- describing at least one model networking design for library buildings, including fiber-to-the-premises, caching, filtering for public computer access, data storage, inside wiring, and inside wireless local area networks; and,

-- commencing at least one FCC-run bidding process to provide a test implementation of said design for rural libraries in one specified region and for urban libraries in another specified region, producing and publicizing the resulting outcomes no later than November 15, 2014.

Further, the Commission should allocate future E-Rate funding by need among library buildings. Need should be ranked according to a three-factor formula:

Users per day + 1/Average Income of Service Area + Estimated Upgrade Cost

Under this approach, the "Estimated Upgrade Cost" would be an estimate of the funding necessary to upgrade the library building to a 1 Gbps connection to the building and 5 Mbps internal downstream connections to end users at peak times.

The E-Rate program appears to have provided schools with about $37.3 billion in funding for the 17 years of the program's life. Libraries inside schools have obtained connectivity through schools. However, public libraries, which are governed very differently than schools, appear to have obtained only $1.7 billion from the E-Rate program. Measured by the 17,000 public library buildings (compared to about 100,000 school buildings), the E-Rate program should have been expanded by an additional $4.6 billion in past years so as to have delivered $6.3 billion in total to libraries. Although this data requires further study, the current woeful state of connections to public libraries seems due, at least in part, to the fact that public libraries have faced a shortfall of about $4.6 billion based on the current size of the E-Rate program.

By recognizing the critical role of the public library, by serving the neediest communities first, and by setting solid, achievable targets for upgrading connectivity, the FCC can fulfill its statutory mission of providing advanced communications services to every American.

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The Urban Libraries Council ("ULC") provides its reply comments in the above-

captioned proceeding pursuant to the Public Notice ("Notice") issued on March 6, 2014 seeking

focused comment on several issues of critical importance to reforming the E-rate program.[1]

These comments concern the nation's public libraries, composed of 9,000 systems with 17,000

buildings. As such, they do not relate to the nearly 100,000 libraries that are inside schools, and

obtain their connectivity through schools.

I.   PUBLIC LIBRARIES SERVE A DISTINCTIVE NEED FOR INTERNET ACCESS AND NEED FUNDING FOR WHOLE NETWORKS

None of the initial comments disputed the fact that public libraries are the most important

free Internet access locations in the civic landscape. To take just one example, "[w]ith over 40%

of all Philadelphia households lacking internet access, the [Free Library of Philadelphia] remains

the region's largest provider of free internet service."[2] More than 90 million adult Americans

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[1]   _See In re Modernizing the E-rate Program for Schools and Libraries_, WC Docket No. 13-184, Public Notice, DA 14-308 (Mar. 6, 2014).

[2]   _In re Modernizing the E-rate Program for Schools and Libraries_, WC Docket No. 13-184, Comments of Free Library of Philadelphia, at 1 (filed Apr. 7, 2014) ("Free Library of Philadelphia Comments"). For ease
(cont'd)

currently are out of the workforce and, therefore, are unable to access broadband at their place of employment.[3] Approximately one third of all households do not have broadband at home.[4] As a result, it is unsurprising that twice as many people annually seek Internet access in libraries than from K-12 schools. Indeed, many of the 55 million students and teachers in K-12 schools use public libraries for Internet access after school hours, on weekends and during vacations.

The initial comments also confirmed that the dominant modern use case for library Internet access is internal Wi-Fi connectivity to a high-speed broadband connection. Kentucky's public libraries report "skyrocketing demands on their wireless networks" in recent years as community members bring their own devices to the library for Internet access.[5] This use case requires that "the E-rate program … focus on end-to-end connectivity all the way to the…library patron's handheld devices…."[6] The City of Boston further believes that "funding internal connections is one of the most important issues that E-rate 2.0 can address."[7] This new preferred connection methodology—high-speed connections to buildings and wireless connectivity within them—requires overhauling the FCC's approach by funding whole networks.[8]

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>   of reading, all further references to "[Party Name] Comments" refer to comments filed by the party of that name on that same day in this same docket.

[3]   *See* Bureau of Labor Statistics, Economic News Release, Employment Situation Summary Household Data at Table A (Apr. 4, 2014), http://www.bls.gov/news.release/empsit.t01.htm (noting that 91,030,000 civilians are not in the workforce as of March 2014).

[4]   Kathryn Zickuhr & Aaron Smith, *Home Broadband 2013*, PEW RESEARCH CENTER'S INTERNET AND AMERICAN LIFE PROJECT (Aug. 26, 2013), http://www.pewinternet.org/2013/08/26/home-broadband-2013/.

[5]   Kentucky Department for Libraries and Archives Comments at 4.

[6]   Schools, Health & Libraries Broadband (SHLB) Coalition Comments at 3.

[7]   City of Boston, Massachusetts Comments at 3.

[8]   Urban Libraries Council Comments ("ULC Comments") at 7-8.

In addition, the E-Rate program must fund, as the Free Library of Philadelphia states, "switch and router tasks and robust equipment that can….increase network efficiency." [9] Many parties agree with this approach, including the State of Illinois, which correctly notes that funding should go to "well-established optimizing devices … includ[ing] … caching and firewalling." [10] The Education Superhighway's recently submitted survey concludes, similarly, that the E-Rate program should fund "equipment such as switches, firewalls, content filters, and internal wiring."[11] Comcast correctly adds that funding should support "caching services, bandwidth optimizers, Wi-Fi controllers"[12] and other key connectivity-enhancing devices. Over the longer term, Zayo is right that the Commission should also "not overlook the importance of allowing for funding of modulating electronics."[13]

The amount of funding necessary to construct adequate library networks depends on three factors: the number of public library buildings, the current state of external and internal bandwidth, and the desired connectivity goal. Libraries provide many kinds of services, but nearly all require at least 1 Gbps connections to library buildings, and at least 5 Mbps download speeds for each Wi-Fi user. As demonstrated in the survey submitted by ULC in its initial filing, even major urban libraries do not currently meet these benchmarks. Libraries need access to FCC data and funding to undertake a statistically significant sample of the status quo in public libraries, in order to estimate the cost for closing the connectivity gap between the inadequate status quo and fulfillment of Congressional and FCC goals. However, subject to more detailed

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[9]   Free Library of Philadelphia Comments at 2.

[10]   Illinois Department of Central Management Services Comments at 8.

[11]   Education SuperHighway Comments at 5.

[12]   Comcast Corporation Comments at 9.

[13]   Zayo Group, LLC Comments at 2.

study, it appears that in the last decade E-Rate funding for public libraries has fallen short of an equitable amount by $4.6 billion dollars.

Finally, innovative local access programs should be able to obtain E-Rate money in some cases. For example, "[t]hrough an innovative pilot initiative… [t]he New York Public Library (NYPL) seeks to increase the overall population who can have the benefit of the open Internet… by which libraries provide portable 4G LTE MiFi devices… to public school students and others underserved to use at home, work, or anywhere they may be."[14]

II. CONNECTIVITY TO AND INSIDE LIBRARY BUILDINGS FALLS FAR SHORT OF MINIMALLY ADEQUATE LEVELS

According to the Information Policy & Access Center, as of 2012, less than 10% of library buildings had to-the-building connectivity greater than 100 Mbps.[15] The vast majority of libraries, therefore, have slower bandwidth to their buildings than is common for tens of millions of residential households.[16]

In its initial comments, ULC provided diagnostic data on connectivity within a number of library systems.[17] This data confirmed that 1 Gbps connections to library buildings are extremely rare. Because Wi-Fi is a shared medium, poor connections to the building lead to woefully inadequate Wi-Fi connectivity within the building. As the ULC data demonstrated,

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[14]   Tony Marx, New York Public Library, Comment entitled *Check Out the Internet: Libraries Lending Internet Access* to *How Can We Strengthen the Internet for Free Expression and Innovation?*, KNIGHT NEWS CHALLENGE (Mar. 18, 2014, 3:33 PM), http://on.nypl.org/1m2oKS0.

[15]   John Carlo Bertot et al., INFORMATION POLICY & ACCESS CENTER, *2011-2012 Public Library Funding and Technology Access Survey: Survey Findings and Results* 21 (2012), http://ipac.umd.edu/sites/default/files/publications/2012_plftas.pdf.

[16]   The Commission is welcome to use the speed test tool to measure connectivity speeds for itself (www.speedtest.net). *The Global Broadband Speed Test*, SPEEDTEST.NET BY OOKLA, http://www.speedtest.net/.

[17]   ULC Comments, Exhibit A.

even the large libraries surveyed for the initial comments demonstrated Wi-Fi connections

inadequate for the basic tasks of completing job applications, filling out online unemployment

forms or watching training videos. Given that 10% of Americans go to libraries for these

purposes every year, libraries must upgrade their internal connectivity in order to play their part

in reviving the economy.

Libraries lack sufficient to-the-building and internal WiFi connectivity because they have

obtained an insignificant amount of E-Rate funds for many years, and their local funding sources

have not been able to make up for the shortfall. In fact, USAC estimates that libraries have

obtained less than 5%, or a little more than $100 million a year, from the E-Rate program to

connect approximately 17,000 buildings and interior spaces.[18] To allow libraries to size

accurately this shortfall, the FCC should make public and machine-readable the requests and

grants by libraries dating back a decade.

In comparison, the United States contains about 100,000 public schools and about 30,000

private schools. Of course, connections go to buildings, and not to abstract categories like school

districts. Nor has ULC been able to discover how many school buildings have obtained

connectivity through the E-Rate program. The interesting Education SuperHighway analysis of

April 2014 does not appear to base its analysis or conclusions on school buildings, but instead

uses school districts as its measuring unit. Because all school buildings' locations, and the size

of the student populations therein, can be determined precisely, it would be wise for the FCC to

study the needs of schools by these metrics, rather than districts. For example, a district with

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[18]   *See* UNIVERSAL SERVICE ADMINISTRATIVE COMPANY, *2013 Annual Report* 44 (2013),
         http://usac.org/_res/documents/about/pdf/annual-reports/usac-annual-report-2013.pdf (USAC reports that
         libraries receive 4.93% of funding under applicant type library).

many buildings may seem on paper to be equivalent to a district with few buildings, but in fact the bandwidth cost to the former will be much higher than to the latter.[19]

Nevertheless, if the E-Rate program has provided funding at a rate of $2.3 billion, on average, for 17 years, then the total funding has been about $39 billion.[20] If schools have obtained 95% of the funding, then a rough approximation is that schools have obtained $37.3 billion and libraries about $1.7 billion since the inception of the program. All of the $37.3 billion has been badly needed by schools and has produced very high rates of Internet access, albeit at inadequate speed, in all American classrooms and in-school libraries. ULC does not begrudge this spending; indeed, many of the initial comments agree that the E-Rate program has been a successful program—at least for schools.

If it can be assumed that the E-Rate program has funded connections to 100,000 school buildings and public libraries occupying 17,000 buildings,[21] it follows that, *mutatis mutandi* in the life of the E-Rate program, public libraries should have received 17% as much money as schools.[22] Seventeen percent of the $37.3 billion spent on E-Rate for schools is approximately

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[19] The Education Superhighway National K-12 E-rate Spending Report states that "locale and district size were selected as the key dimensions" but it would seem that the number of students in a building and the location of the building in relation to existing fiber networks would be much more important factors in any estimate of cost for connectivity. EDUCATION SUPERHIGHWAY, *Connecting America's Students: Opportunities for Action - An Analysis of E-rate Spending Offers Key Insights for Expanding Educational Opportunity* 37 (2014), http://www.educationsuperhighway.org/uploads/1/0/9/4/10946543/esh_k12_e-rate_spending_report_april_2014.pdf.

[20] All E-Rate funding has required a matching grant, so the true size of spending on communications sparked by the E-Rate program is not revealed by this statistic. The FCC should determine this information. The Education Superhighway National K-12 E-rate Spending Report of April 2014 does not appear to have taken the matching amount into account. *Id.*

[21] *See* School Building Statistics, NATIONAL CLEARINGHOUSE FOR EDUCATIONAL FACILITIES, http://www.ncef.org/ds/answer.cfm?StatId=2 (last visited Apr. 21, 2014). School buildings close and open (churn) at a rate of about 1 to 2% a year.

[22] As the American Library Association has stated, the United States has about 120,000 libraries. But very roughly, every school building has a library, so 100,000 libraries are inside schools and obtain their connectivity through schools. Of the remaining 20,000 library systems, about half are corporate or

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$6.3 billion, which by rough justice is the total amount the E-Rate program should have provided for the last 17 years in order to produce parallel connectivity levels for libraries as schools. If libraries instead actually received $1.7 billion in funding, then they faced a shortfall in the amount of $4.6 billion. The level of E-Rate funding, in that case, should have been increased in total from $39 billion to $43.6 billion. No wonder, then, that Internet connectivity to and inside public libraries is so inadequate.

The funding for schools also should have been increased over the last 17 years. The National Education Association correctly notes that since the funding level was set at $2.2 billion in 1997, "the E-rate Program…has not even kept up with inflation."[23] Indexing for inflation, the 1997 level should now be $3.2 billion. Schools (as well as public libraries) should have obtained billions of dollars more over the last 17 years. As the Education and Library Networks Coalition stated, "the program's annual funding cap, set more than 15 years ago, is simply inadequate to keep up with need."[24]

Meanwhile, demand for bandwidth in public libraries has continued to increase. As a result, the American Library Association reports that "88 percent of state library agencies say that a majority of their libraries will need bandwidth upgrades within the coming two years."[25]

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    academic and outside the E-Rate funding. The other half are composed of 9,000 public library systems with 17,000 buildings. This is the group that should have received, on a building to building comparison, $6.5 billion while school buildings were obtaining $38 billion. *ALA Library Fact Sheet 1 - Number of Libraries in the United States*, AMERICAN LIBRARY ASSOCIATION, http://www.ala.org/tools/libfactsheets/alalibraryfactsheet01 (last visited Apr. 21, 2014).

[23]   National Education Association Comments at 12.

[24]   Education and Library Networks Coalition Comments at 3.

[25]   American Library Association Comments at 3.

III.   LIBRARY FUNDING SHOULD BE PREDICTABLE, NEEDS-BASED, AND EFFICIENT

Every significant public policy program needs an objective function: a formula that assists the relevant agency in maximizing policy outcomes. The objective function for public libraries should be to maximize Internet access for library users per dollar of FCC funding. To this end, the FCC should empower libraries to determine the difference between the level of existing connectivity and the level of necessary connectivity both outside and inside every library building. Libraries also need to report their number of daily users.[26] ULC recognizes the challenges in requiring all libraries to provide this information. A statistically valid sample should suffice, however, which ULC understands to be a survey of approximately 400 appropriately selected libraries. The FCC should fund such a survey, to be completed no later than September 15, 2014, in order to gather a picture of the current connectivity deficit. As demonstrated by the survey ULC reported in its initial comments, ULC has the ability to develop this kind of comprehensive, statistically representative survey if funds are made available. Once this data gathering is complete, the Commission, its information technology ("IT") advisors and libraries should be able to determine the cost of closing the library connectivity gap and the correct prioritization of spending so as to have maximum impact measured by users.

ULC also recommends that all libraries seeking program funding be required to state their current outside and inside connectivity levels, service area population, open hours, number of users per day, and average income in service area based on Bureau of Labor Standards statistics. To that end, the United States Telecom Association is correct that "[t]he Commission

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[26]   For this filing, ULC asked 26 member libraries to report users per day; the results range from about 1,000 to about 5,000. By contrast, new school buildings now contain approximately 700 students for elementary schools, 900 students in middle schools, and 1,500 students in high schools. *See School Building Statistics,* NATIONAL CLEARINGHOUSE FOR EDUCATIONAL FACILITIES, http://www.ncef.org/ds/answer.cfm?StatId=24 (last visited Apr. 21, 2014).

could encourage…libraries…unable to obtain adequate…broadband…to self-identify."[27] As shown by the survey ULC produced in less than ten days for the initial filing, this data is easily gathered and is necessary for each library to participate in an efficient process that will allow procurement of greater bandwidth.

Once the connectivity gap is identified, the FCC inevitably must decide how to prioritize its funding. Schools and libraries cannot expect to catch up in one day for past deficiencies in broadband funding. However, all libraries deserve FCC support, despite Verizon's contention that "[t]here is…no evidence…support is necessary" for wealthier applicants.[28] As suggested by the City of Boston, "the Commission [should] allocate funds by focusing on the greatest economic need."[29] The State of Illinois is similarly correct that "a combination of economic need and efficiency metrics provides a good approach to prioritizing funding and ensures assistance is directed to those in need while being efficient with the funds."[30]

Many parties recognized the benefits of a needs-based approach for funding priority in their initial comments. AT&T suggests "the Commission could prioritize funding [according to measurements of] inadequate broadband."[31] Others noted that "low-income households are significantly more likely than…higher-income households to view libraries as 'very important' to them."[32] In fact, few parties disputed that "[f]unding for internal connections should be

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[27] United States Telecom Association Comments at iii.

[28] Verizon Comments at 4.

[29] City of Boston Comments at 3.

[30] Illinois Department of Central Management Services Comments at 9.

[31] AT&T Comments at 1.

[32] Minority Media and Telecommunications Council, the Rainbow PUSH Coalition, and the League of United Latin American Citizens Comments at 13 (internal citation omitted).

available…on an equitable basis."[33] Defining the correct parameters of need, therefore, is critical. ULC submits that these parameters should include number of users per day, the gap between existing bandwidth and the defined goal for bandwidth, and relative income levels of a library's service area.

ULC suggests the following needs-based formula for determining a hierarchy of need:

Users per Day + 1/Average Income of Service Area + Estimated Upgrade Costs

Under this approach, the upgrade costs would be an estimate of the funding necessary to upgrade the library building to a 1 Gbps connection to the building and 5 Mbps internal connections to end users at peak times.

After need is determined, libraries still must participate in an efficient bidding process. However, the bidding process must recognize the different governance regimes applicable to different library systems. Some systems have authority to make their own decisions for technology and Internet services. They can choose to join in an FCC-sponsored collective bidding process, or can be asked to create their own collective bidding. Others are governed by states or local authorities. The FCC should obtain from each library a description of its relevant governance regime so as to foster efficient bidding processes that suit different forms of public library governance.

To test methodologies for the new library bidding process, the Commission should select one rural and one urban region and conduct bidding processes for the libraries in each region. The FCC should produce and publicize the results of this demonstration project no later than November 15, 2014. By publicizing the results of the project, state and local officials across the

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[33]   Hewlett-Packard Company Comments at 2.

country will have greater insight into how much bandwidth can be obtained when libraries can freely participate in consortium-based or regionally-based bidding processes.

IV. THE IMMEDIATE FCC ORDER SHOULD FOCUS ON PROCESS, DATA-GATHERING, AND SHORT-TERM FUNDING

The Commission, in concert with the library community, must determine the funding necessary to achieve sufficient levels of Internet connectivity to and within the nation's public libraries. The United States Telecom Association is correct that "the Commission [could offer] libraries access to 'digital template' software that could help them readily determine the parameters of the broadband network that will meet their particular requirements."[34] Comcast wisely notes that libraries need access to "technical resources and guidance to assist them in assessing their technological needs and formulating efficient network plans."[35]

The end result is that the Commission must determine the size of what might be called the L-Rate; that is, the amount of funding that public library systems need to upgrade all 17,000 public library buildings. This estimate should (i) be based on the most practical contracting method for upgrading existing connections, (ii) assume a minimum 1 Gbps connection to the building, (iii) assume a minimum 5 Mbps downstream and 1 Mbps upstream Wi-Fi connectivity within the building for all users at all hours, and (iv) be completed no later than November 15, 2014. As with the sample survey of the connectivity deficit discussed above, ULC can provide this estimate, if a modest amount of E-Rate funding could be made available to pay for the work.

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[34] United States Telecom Association Comments at iii.

[35] Comcast Corporation Comments at 3.

V.   BY THE END OF 2014, FCC SHOULD PUT IN PLACE A LONG-TERM, DURABLE PLAN

As Chairman Wheeler stated at the Institute for Museum and Library Services hearing on April 17, 2014, the FCC would benefit from pilot programs funded by June and producing information by the end of the year.[36] ULC submits that its proposed pilot projects are meritorious and should be funded now or in an order issued not later than June. Other groups, such as the American Library Association, have suggested other useful pilots that deserve to be funded. Providing that the total amount of money dedicated to pilots remains an equitable percentage of the total E-Rate annual disbursements, funding multiple pilots would be a useful exercise.

In the long run, the FCC will need to develop an approach to provide significantly more funding to libraries to pay for the significant upfront costs of deploying external connections and providing internal wiring, and comparatively less money for ongoing maintenance and electronics upgrades. Internet and IT operations with high capital costs and relatively low operating costs are common for commercial customers. This same model needs to be adopted by the E-Rate program on a building-by-building basis as those needs become increasingly prominent. The FCC should begin collecting data on these needs now in order to be prepared to develop and implement such a plan in the future. ULC submits that the FCC should dedicate the remainder of the year to developing an appropriate blueprint for the long-term plan of operation for the E-Rate program -- or, with respect to libraries, the L-Rate program.

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[36]   Institute of Museum and Library Services, Hearing: *Libraries and Broadband: Urgency and Impact*, (Apr. 17, 2014) (statement of FCC Chairman Thomas Wheeler), http://www.c-span.org/video/?c4495997/fcc-chairman-tom-wheeler.

VI.   CONCLUSION

Chairman Wheeler, in his comments at the IMLS hearing on April 17, eloquently evoked Andrew Carnegie in describing his own goal for the modernization of the E-Rate program. If Carnegie shaped the public library experience for a century, so now the FCC and libraries can cooperate to shape the library experience for the 21st century. Now is the time for libraries to leap into the future. Now is the time for tens of millions of Americans to walk into the free public space of Internet access that public libraries can offer. If libraries, the FCC and all other stakeholders work together to fulfill the vision described by Chairman Wheeler, this vision can become reality.

Respectfully submitted,

URBAN LIBRARIES COUNCIL

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