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

In The Matter of	)	
	)	
Wireline Competition Bureau Seeks Comment on	)	WC Docket No. 13-184
Category Two Budgets	)	

COMMENTS OF COSN, EDUCATIONSUPERHIGHWAY & FUNDS FOR LEARNING

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CoSN, EducationSuperHighway and Funds For Learning respectfully submit these comments in response to the Public Notice in the above referenced proceeding.

INTRODUCTION AND SUMMARY

Over the last three years, the Commission's 2014 modernization of the E-rate program has catalyzed tremendous progress in making advanced telecommunications services available in America's schools. Thanks to E-rate modernization, 35 million more K-12 students have access to the FCC's minimum threshold of 100 kbps per student of Internet access; 97% of schools are now connected by fiber and 88% of schools have robust Wi-Fi.[1] The program is enabling schools across the country to leverage digital learning to empower teachers, transform learning and give every student equal access to educational opportunity.

Nowhere has the impact of E-rate modernization been more apparent than in classrooms that now have Wi-Fi. During the three years prior to E-rate modernization, only 11% of schools

[1] *See* EducationSuperHighway, *2017 State of the States: Fulfilling Our Promise to America's Students* (September, 2017) available at http://stateofthestates.educationsuperhighway.org/ ("*2017 State of the States*").

received E-rate funding for internal connections.[2] As a result, in 2014 only 25% of schools reported that they had sufficient Wi-Fi in their classrooms to enable digital learning.[3] E-rate modernization addressed these issues by allocating $1 billion per year of E-rate funds for internal connections and distributing it based on a $150 per student budget.[4] Consequently, in the three years following E-rate modernization, 78% of schools received E-rate funding for internal connections and 88% of schools have LAN / Wi-Fi networks capable of supporting digital learning.[5]

Despite this progress, we anticipate that significant additional upgrades will occur in the next two years. E-rate modernization promised school districts and libraries a five-year window (2015-19) to use their $150 per student budgets, and funding requests are in line with the Commission's expectations – averaging just over $1 billion per year.[6] Moreover, because approximately 44% of districts now have Wi-Fi networks that are 4 or more years old,[7] we anticipate the vast majority of the $2.3 billion in Category Two funding that remains will be utilized over the next two years.[8] Indeed, a survey of districts that have spent 0 -15% of their Category Two budgets revealed that only 3% do not have plans to use their funding over the next two years.[9]

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[2] Ibid p. 19.
[3] *See* "Consortium for School Networking, CoSN's E-rate and Broadband Survey 2013", (October 2013), *available at:* http://www.cosn.org/sites/default/files/2013EratebroadbandFinal.pdf.
[4] The inflation adjusted amount of $153.47 is utilized for budget calculations.
[5] See *2017 State of the States* at 19 and 6.
[6] The average $ requested from 2015-2017 was $1.022 billion.
[7] *See* Funds For Learning , *2016 E-rate Trends Report* (Sept. 2016), *available at* https://www.fundsforlearning.com/2016ErateTrends.php.
[8] It is widely agreed that LAN / Wi-Fi networks need to be upgraded every five years. This is why the Commission created a five year funding cycle and it is interesting to note that the percent of C2 funds remaining (46%) roughly approximates the 44% of districts with networks that are reaching their end of life and will need upgrades in the next two years.
[9] Source: Applicant survey. See Appendix A

With its *Public Notice Seeking Comment on Category Two Budgets*, the Wireline Competition Bureau (Bureau) begins the process of evaluating the sufficiency of Category Two budgets for schools and libraries. In these Comments, EducationSuperHighway, CoSN and Funds For Learning provide *initial* input on the Bureau's questions. Specifically, we identify issues related to the administration of Category Two budgets from both a policy perspective and with regard to the application process that we believe can improve the effectiveness and impact of the E-rate program. We also provide the Bureau with input from applicants in the form of both survey responses and specific examples of applicant spending on LAN / Wi-Fi networks. Finally, we provide an analysis of Category Two spending across different types of applicants and regions of the country.

While it is too soon to arrive at any final conclusions regarding the sufficiency of Category Two budgets,[10] our data collection and analysis does compel several conclusions upon which the Bureau should act upon:

1. The Bureau should take action to address several administrative issues that are making it difficult for applicants to use their Category Two budgets, including: (i) allocating budgets at the district vs. building level; (ii) eliminating the requirement for applicants to limit their Form 471s to $150 per student and instead applying the $150 budget in the Funding Commitment Decision Letter (FCDL); (iii) eliminating the need to cost-allocate for multi-function equipment when ineligible features represent only a small portion of the functionality of the equipment; and (iv) speeding up Category Two application approvals so school districts have decisions prior to the summer installation window.

[10] A complete analysis of the sufficiency of Category Two budgets requires both significantly more time for data collection and additional evidence that will only be available with at least one more year of program operations.

2. No changes should be made to the Category Two budgets until the five-year period promised to applicants has concluded. School districts and libraries are counting on these funds being available and up to 22.7 million students could be left without robust Wi-Fi and access to digital learning in their classrooms if the Category Two budgets are not available as promised. The Bureau should issue a public notice reaffirming that applicants will have access to their $150 per student budgets through FY19.

3. Continue data collection on the sufficiency of E-rate Category Two budgets through the FY18 E-rate cycle so that the Bureau has the data it needs to properly evaluate applicant costs. By addressing #1 above, the Bureau will have complete data on what applicants are actually buying to compare to the $150 per student budget.

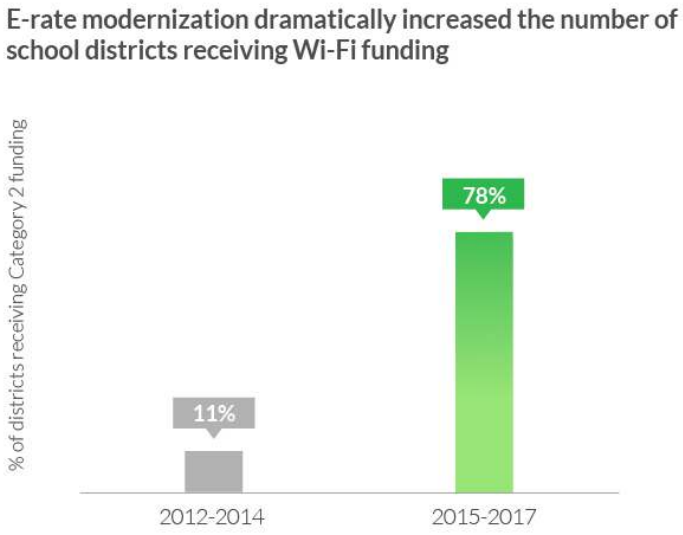
In addition, our preliminary analysis and input from applicants suggests that there are situations in which the $150 per student budget will need to be increased if the Commission wants to ensure that districts can afford the enhanced LAN / Wi-Fi networks that are expected to be needed as the sophistication of K-12 digital learning and broadband networks increase.

I. E-RATE MODERNIZATION HAS BEEN AN UNQUESTIONED SUCCESS – PARTICULARLY WITH REGARD TO THE DEPLOYMENT OF ROBUST LAN / WI-FI NETWORKS

In 2014, the FCC modernized the E-rate program with the objective of closing the digital divide within five years. This catalyzed a sea change in the broadband available in America's schools and, as a result, 35 million students have been connected to digital learning and educational opportunity. E-rate modernization also dramatically improved the infrastructure needed to deliver high speed broadband to classrooms. Over the last three years we have seen a 90% decrease in the number of schools that lack fiber optic connections and a more than 3x

increase in the number of schools reporting that they have sufficient Wi-Fi in their classrooms. Finally, E-rate modernization has dramatically improved the affordability of broadband, reducing the cost per Mbps paid by schools by 78%.

Nowhere has the impact of E-rate modernization been more apparent than in bringing Wi-Fi into the classroom. By focusing the E-rate program on broadband, modernization made possible the FCC's $1 billion per year of Category Two funding and by allocating this funding on a per student basis, the Commission ensured that all schools would have the opportunity to deploy robust LAN / Wi-Fi networks in their classrooms. During the three years prior to E-rate modernization, only 11% of schools received E-rate funding for internal connections. As a result, in 2014 only 25% of districts reported that they had sufficient Wi-Fi in their schools to enable digital learning. In the three years following E-rate modernization, 78% of districts received E-rate funding for internal connections and 88% of schools report having LAN / Wi-Fi networks capable of supporting digital learning.



E-rate modernization has clearly delivered on the Commission's goal of "providing more equitable funding for broadband within schools and libraries."[11] This is not only the case at a macro level, but is also true when one looks at the availability of internal connections funding by locale and district size.

Table 1: E-rate Category 2 usage by locale and district size[12]

Group	District locale		District size		
	Rural / Town	Urban / Suburban	Tiny / Small	Medium	Large / Mega
% of districts that received Priority 2 funds pre- modernization	10%	14%	8%	14%	29%
% of districts that received Category 2 funding post- modernization	76%	82%	74%	88%	94%

II. APPLICANTS ARE ON-TRACK TO UTILIZE THE $5 BILLION OF E-RATE FUNDS ALLOCATED FOR CATEGORY TWO BUDGETS FOR ERATE FY2015-19

Since E-rate modernization, $3.39 billion of Category Two funding (post-E-rate discount) has been requested by schools and libraries across the three years (2015, 2016, 2017) that Category Two budgets have been in place. This investment falls in line with the $1 billion per year the Commission budgeted for the program.

Looking forward, we expect that the vast majority of the $2.3 billion in remaining Category Two funds will be utilized in the coming two years. This conclusion is supported by the fact that approximately 44% of districts now have Wi-Fi networks that are four or more years old and are thus at or near the end of their expected five year life span and will likely be

[11] Modernizing the E-rate Program for Schools and Libraries, FCC 14-99, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, Order Released July 23, 2014 at 90.
[12] See Appendix C for District size and locale classifications.

upgraded in the next two years. It is also supported by a survey of school districts that have spent less than 15% of their Category Two budgets. The survey asked districts why they had not yet used their Category Two budgets and if they intended to use them prior to the end of the FY2015-19 period. **Only 3% of respondents indicated that they did not intend to use their remaining Category Two budgets** and most had delayed using their budgets either because they had upgraded their LAN / Wi-Fi networks just prior to FY2015, were in the process of obtaining the matching funds they needed, or were struggling to determine what they needed to buy.

III. UNNECESSARY FCC REGULATORY REQUIREMENTS AND USAC'S CAPACITY LIMITATIONS ARE MAKING IT DIFFICULT FOR APPLICANTS TO UTILIZE THEIR CATEGORY TWO BUDGETS

While E-rate modernization has dramatically accelerated the deployment of robust LAN / Wi-Fi networks into the classroom, the full potential of Category Two budgets has not been realized because of three unnecessary regulatory requirements and USAC's internal staffing limitations. The addressable problems make it unnecessarily difficult for applicants to utilize their funding. The Bureau should take immediate action to address these issues in conjunction with USAC.

1. **Budgets should be set at the district and library system level, not the building level.**

   Currently, Category Two budgets are allocated at the building level and funds cannot be transferred from one building to another within a school district or library system. Each facility is provided the same basic budget formula regardless of the facility's age or its specific technology needs. A recently opened facility may not need as

much support as an older facility, but the building-level budgets treat both facilities the same. This has created a situation where some Category Two funds go unused at one building while another building in the same system needs additional Category Two funds. As a result, Category Two funds remain unspent while some students remain without Wi-Fi.

Rockingham Public Schools in Virginia is a concrete example of this issue. According to the district, "Our high schools are some of our newest buildings, so money that we could use in middle or elementary schools will go unused because we don't have $150,000 of infrastructure needs in a 1,000 student high school. The current Category Two budget approach does not take into consideration that perhaps some smaller schools have greater infrastructure needs than larger schools."

This limitation has also been a challenge for Wawasee Community Schools in Indiana: "If the funds could be used across the district instead of per building then when funds run out for one building funds that are left over from another building could be used to finish the building that had less funds. The way it is setup now a district will have to spend extra funds to complete an upgrade that will not be counted as Category Two." Miami-Dade County Public Schools had a similar experience, suggesting that the Commission should "allow districts to transfer unused funds. Currently, a significant total of available funds are left on the table instead of fulfilling the needs of other schools."

The use of building level budgets also creates a tremendous, unnecessary increase in the administrative burden associated with Category Two budgets. Rather than managing a single Category Two budget, school districts are forced to manage and

monitor numerous budgets, hundreds in the case of the largest districts. In fact, because USAC also requires applicants to submit funding requests for each line item in a building's Category Two request, and then creates, in essence, sub-budgets for each line item, the number of budgets applicants are required to manage can grow exponentially. Appendix A shows an example of the complex tracking system one school district developed in order to manage the administrative burden created by these rules.

For example, a school district with twenty schools that is applying for WAPs, switches, and wiring for each school must include sixty unique line items on its application. USAC then allocates sub-budgets for each line item, which requires the district to then manage and monitor sixty different budgets. Moreover, these sub-budgets then further restrict the ability of applicants to use their Category Two budgets as USAC applies the same rules to sub-budgets as it does to transfers between schools - i.e. applicants are not allowed to transfer unused funds from a switch sub-budget to a WAP sub-budget, even within the same school unless and until they receive an approved service substitution request from USAC, a completely unnecessary, burdensome process in its own right. Perhaps more than anything, the complexity and administrative burden created by the Bureau's requirement for school specific and line-item sub-budgets is driving the significant increase in the number of applicants now using E-rate consultants.[13] With 70% of applicants relying on one person to manage the E-rate application process, it is no wonder that this difficult, onerous and time-consuming process requires additional support.[14]

[13] The percentage of applicants using E-rate consultants has risen from 49% in FY14 prior to 60% in FY 16.
[14] *See* Funds For Learning , *2016 E-rate Trends Report* (Sept. 2016), *available at* https://www.fundsforlearning.com/2016ErateTrends.php, p. 11.

In its first E-rate modernization order, the Commission provides no rationale for setting Category Two budgets at the building level rather than the district level other than the desire to limit funding to instructional facilities.[15] Given that this decision is clearly limiting progress toward the Commission's goal of ensuring equitable access to Wi-Fi in America's schools and libraries and there is no statutory, regulatory, policy or administrative reason for it, the Commission should take immediate action to set budgets at the district rather than building level and allow applicants to determine the best use of these funds as long as they are used to deploy robust LAN / Wi-Fi networks in instructional facilities.

2. Applicants should submit the entire cost of their Category Two projects and USAC should simply limit funding in the FCDL to the amount of Category Two budget the applicant has remaining.

A second issue that is dramatically increasing the administrative burden associated with Category Two budgets is USAC's requirement that applicants only submit applications which are equal to or less than the amount of Category Two funding remaining for each building or sub-budget. This causes applicants to go through a time consuming process of taking the bill of materials submitted by vendors with their bids and extracting out a subset of line items that will fit within the remaining budget for each building and its associated line item sub-budgets.

This approach is problematic for three reasons. First, it dramatically increases the administrative burden on districts during the application process. Second, it significantly increases both the complexity and time required in the PIA process for both USAC and

[15] Modernizing the E-rate Program for Schools and Libraries, FCC 14-99, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, Order Released July 23, 2014 at 90.

applicants as significant time is spent ensuring that the requested items fit within both building and line item sub-budgets. Third, when combined with the inability to transfer budgets between buildings or sub-budgets, it causes districts to abandon funds rather than go through the additional administrative work (filing a Form 500) required to recover unused funds from sub-budgets.

A much more effective approach would be to allow districts to file their entire bill of materials with their Form 471 and simply limit the funding approved in the FCDL. This would eliminate the administrative burden on applicants and would also provide USAC, the Commission and the public with significantly greater transparency as to what applicants are using their Category Two budgets for and whether these budgets are sufficient.

3. The Bureau should eliminate the need for cost allocation of ineligible functionality when the eligible functionality of the equipment is its primary function.

A third issue that is increasing the administrative burden associated with Category Two budgets is the requirement that applicants cost-allocate ineligible functionality out of their applications for Category Two eligible equipment. While this makes sense if the ineligible functionality is the primary function of the equipment being purchased, in many cases it represents only incidental functionality that vendors have included to remain competitive in an evolving market. Over time, this has made it increasingly difficult for applicants to purchase equipment that only provides the E-rate eligible functionality they are seeking. Examples include firewalls that offer basic content filtering functionality, and switches and routers that offer network monitoring and management functionality.

Performing these cost allocations is a time consuming process that requires applicants to obtain cost allocation information from vendors (which is not always readily available) and then modify their Category Two applications. It also significantly increases the complexity and duration of the PIA process as USAC must review these cost allocations and applicants must respond to any questions that arise. In many ways, this is the most costly aspect of this requirement as it delays when applicants are able to begin their LAN / Wi-Fi upgrades and can cause them to miss the critical summer installation window.

A more effective approach would be to eliminate the need for cost allocation of ineligible functionality when the eligible functionality of the Category Two equipment is its primary function. This would reduce administrative burdens, speed up the approval process and recognize that in the majority of these situations applicants are unable to purchase equipment that provides only E-rate eligible functionality. It also is unlikely to have a significant cost impact on the program as excluding cost-allocated ineligible functionality likely represents a very small amount of savings for the program.

4. USAC should speed the approval of Category Two projects so that districts can install equipment during the summer recess.

While excessive, unnecessary FCC regulatory requirements make it difficult for applicants to utilize their Category Two budgets, the long waits for application approvals are discouraging applicants from even applying for Category Two funding. These USAC delays are the result of burdensome regulations like those described above, but are also caused by staffing, technology and other internal capacity limitations. In 2016, the median Category Two application took 164 days to approve while 25% of applications

took more than 223 days to approve. In fact, no Category Two applications received an FDCL in time for the start of the critical summer installation window.[16] Technology leaders need to start upgrades during the summer months when school is closed, and when they can take classrooms offline without disrupting learning.

Excessive delays create significant issues for applicants in planning, budgeting, implementation and risk management. Renton School District 403 in Washington notes the challenges that approval delays create in planning LAN / Wi-Fi projects, "year over year we experience one year delays on approval which turn a one year planning window into a two year window."[17] Highline School District 401 in Washington notes the impact of approval delays on budgeting, "Our project went through an audit. By the time it was funded, Highline did not have the budget capacity to complete the work and we had to let the project go." This is a sentiment also echoed by Winchester Public Schools in Virginia, "the length of time from 470 to FCDL makes budgeting difficult."

The impact of approval delays on implementation is discussed by Rollinsford School District in New Hampshire. "Delays in getting approval and funding delay when we can start projects. Since summer is the time for major projects at schools, it would be good to speed up the approval process." These delays also create challenges with risk management that results from needing to install equipment during the summer. As Hudson School District in Wisconsin points out, "the time it takes to get certified is really long. We are purchasing equipment without knowing if our project has been approved."

By reducing the complexity and administrative burden of the Category Two application process and enhancing the staffing and other internal capacity of USAC to

[16] Many districts start their installations on July 1 to ensure that projects will be complete before the school year starts and will not disrupt learning when school is in session.
[17] See Appendix B for survey details.

process applications more quickly, the Bureau can increase the number of districts that are able to take advantage of the critical summer window for LAN / Wi-Fi network upgrades while reducing the financial risk faced by applicants.

IV. THE $150 PER STUDENT CATEGORY TWO BUDGET IS NOT SUFFICIENT FOR SOME APPLICANTS

Most E-rate applicants do not believe that the current Category 2 budget of $150 per student provides sufficient funding for their needs. In 2017, 82% of districts anticipated that they need $250 per student or more for internal networks - nearly $100 more than what the FCC currently budgets. For libraries, only 37% believe the current budget of $2.30 per square foot for rural libraries and $5.00 per square foot for urban libraries is enough. The remaining 63% of library applicants anticipate they need at least $3.00 per square foot and $6.50 per square foot, respectively.[18]

These estimates are corroborated by the experience of many districts - especially those requiring wiring upgrades.[19] Boston Public Schools, which upgrades each of their school LAN / Wi-Fi networks every five years reports averaging $420 per student for their upgrades. The Salinas City Elementary School District in California's upgrade project cost over $775 per student and included the replacement of both wiring and all major network electronics (switches, WAPs etc.). Wilsona School District and Fruitvale USD in California both exhausted their Category Two budgets on wiring projects that cost $295 & $352 per student respectively and thus were unable to make much needed upgrades to their network electronics.

[18] *See* Funds For Learning , *2016 E-rate Trends Report* (Sept. 2016), *available at* https://www.fundsforlearning.com/2016ErateTrends.php.

[19] Based on estimates from the E-rate consultancy Infinity Consulting and Communications, school districts usually plan for $200 per student for wiring upgrades, in addition to $200 per student for network electronics.

A significant number of schools appear to need to upgrade their wiring as part of their Category Two projects. Among districts we contacted that have spent over 85% of their budgets, over half have included wiring upgrades in their projects. More broadly, 27.5% of applicants that included wiring costs in their Category Two Form 471s have exhausted their full $150 per student budget compared to only 6.2% of all Category Two recipients. If the Commission wants to ensure that all schools have robust LAN / Wi-Fi networks, it should consider providing additional Category Two budget allowances for applicants who request funding for wiring.

V. ROBUST LAN / WI-FI NETWORKS ARE CRITICAL TO ENABLING DIGITAL LEARNING IN THE CLASSROOM

Internal network connections are an essential component of K-12 broadband networks. No matter how fast the fiber connections are to a school building, if schools do not have robust LAN and Wi-Fi networks that reach every classroom and learning area, students and teachers will be unable to take advantage of the promise of digital learning. Whether supporting sophisticated career and technical education opportunities, better meeting the needs of students with disabilities, accessing advanced placement courses and digital resources not offered at their schools or leveraging technology to personalize learning for each student, Wi-Fi is critical to 21st century teaching and learning.

The critical nature of Wi-Fi is reflected in Funds For Learning's *2016 E-rate Trends Report*. 72% of applicants said "that Wi-Fi is critical to fulfilling their organization's mission" while 93% reported that Wi-Fi in the classroom is "extremely important" or "very important".[20] As educational technology has moved from the computer lab to the classroom, schools without

[20] *See* Funds For Learning , *2016 E-rate Trends Report* (Sept. 2016), *available at* https://www.fundsforlearning.com/2016ErateTrends.php.

robust LAN / Wi-Fi networks will find themselves unable to give their students equal access to educational opportunity.

Bloom Township High School District 206 in Illinois is a case study in the importance of deploying robust LAN / Wi-Fi networks in schools. In 2015 the district used E-rate Category Two funds to upgrade its Wi-Fi networks. This enabled it to deploy 3,000 Chromebooks as part of a digital learning initiative that has made online video and cloud applications an integral part of the curriculum.[21] Without robust Wi-Fi, the Internet-dependent Chromebooks would not have been a viable solution for the district's digital learning needs and students and teachers would be limited in their use of technology in the classroom.

VI. IF CATEGORY TWO BUDGETS ARE REDUCED PRIOR TO E-RATE FY2019, UP TO 22.7 MILLION STUDENTS COULD BE LEFT WITHOUT ROBUST WI-FI AND DIGITAL LEARNING IN THEIR CLASSROOMS

As discussed earlier, 44% of school districts have LAN / Wi-Fi networks that are four or more years old. As the Commission notes in its first E-rate modernization order**,** "The record demonstrates that most category two equipment has a typical lifecycle of approximately five years."[22] Thus, it is reasonable to expect that most of the districts with LAN / Wi-Fi networks will need to upgrade those networks in the next two years. This is consistent with the roughly 43% of Category Two funding that remains unspent.

If Category Two budgets are reduced prior to E-rate FY2019, many of these schools will be unable to upgrade their LAN / Wi-Fi networks. This could leave up to 22.7 million students without internal connections that are able to keep up with the growing demand for digital

[21] Wong, Wylie, "Schools Focus on Infrastructure After Securing E-rate Funding", EdTech Magazine, (July 2016)
[22] Modernizing the E-rate Program for Schools and Libraries, FCC 14-99, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, Order Released July 23, 2014 at 90.

learning in the classroom.[23] This is not inconsistent with USAC data that suggests 88% of schools have "sufficient" Wi-Fi. As the use of digital learning increases in the classroom, networks that are sufficient today will no longer be sufficient as the breadth and bandwidth intensity of educational technology applications increases.

As seen in Table 2, any reductions in Category Two budgets will be felt across the nation. However, it is small, rural states such as Maine, Maryland, New Hampshire, Utah and Wyoming that stand to have the greatest number of districts substantially impacted.

Table 2: E-rate Category 2 usage by state

State	% of student that could lose funding if program is changed	# of students that could lose funding if program is changed	Amount of money that could be lost if program is changed
AK	40%	46.7k	$5.1M
AL	38%	277.7k	$28.7M
AR	52%	238.7k	$26.9M
AZ	38%	340.7k	$35.6M
CA	51%	2,854.8k	$297.7M
CO	55%	409.1k	$41.1M
CT	57%	281.5k	$24.1M
DE	53%	59.7k	$6.9M
FL	40%	958.3k	$110.6M
GA	40%	654.8k	$70.2M
HI	56%	95.1k	$9.9M
IA	58%	274.6k	$28.2M
ID	60%	159.9k	$16.4M

[23] Calculated based upon the percentage of funding remaining at a district level and then applied to the student population to represent those that would be served by remaining or future funding (e.g. 1,000 students in a district with 30% funding remaining accounts for 300 students that "could lose funding").

IL	45%	855.7k	$81.3M
IN	48%	483.5k	$47.9M
KS	61%	282.7k	$30.1M
KY	37%	244.5k	$28.8M
LA	27%	176.4k	$20.7M
MA	55%	475.3k	$41.3M
MD	71%	584.3k	$58.6M
ME	73%	124.5k	$13.1M
MI	54%	715.9k	$68.9M
MN	54%	422.3k	$38.8M
MO	49%	424.7k	$43.1M
MS	45%	215.7k	$25.5M
MT	59%	83.4k	$9.8M
NC	38%	547.k	$58.8M
ND	59%	61.2k	$6.6M
NE	61%	182.4k	$18.5M
NH	68%	120.8k	$10.3M
NJ	46%	587.6k	$48.7M
NM	54%	166.1k	$19.4M
NV	62%	261.5k	$29.9M
NY	55%	1,406.8k	$152.9M
OH	61%	952.1k	$94.9M
OK	38%	239.k	$27.M
OR	51%	272.7k	$28.7M
PA	56%	876.5k	$85.9M
RI	65%	84.3k	$7.8M
SC	41%	307.6k	$33.5M
SD	60%	76.9k	$8.2M

TN	58%	544.k	$58.7M
TX	45%	2,147.2k	$238.9M
UT	75%	415.5k	$36.5M
VA	49%	612.7k	$59.3M
VT	60%	44.9k	$4.8M
WA	50%	555.1k	$54.7M
WI	39%	307.5k	$31.M
WV	55%	144.9k	$17.3M
WY	68%	63.k	$6.1M
TOTAL	**50%**	**22,745.1k**	**$2,351.2M**

In 2014, the Commission made a promise to E-rate applicants that they would have five years to use their Category Two budgets. District technology leaders must work with an array of stakeholders to secure local funding for these projects, including coordinating closely with their superintendents, school boards, and local telecommunications providers. This planning and coordination takes time and if the FCC changes direction now, significant local work and investment will be forfeited. If we are going to close the K-12 digital divide the FCC must stay on its promised course and Category Two budgets must not be reduced prior to FY20. To ensure these budgets are used most effectively, the Bureau should issue a public notice reaffirming that applicants will have access to their $150 per student budgets through FY19.

VII. THE WIRELINE BUREAU SHOULD CONTINUE DATA COLLECTION ON THE SUFFICIENCY OF CATEGORY TWO BUDGETS THROUGH THE E-RATE FY18 CYCLE

We applaud the Bureau's efforts to collect data on the sufficiency of Category Two budgets prior to reporting on the sufficiency of these budgets before the opening of the filing

window for funding year 2019. Unfortunately, the amount of time allocated for data collection in the *Public Notice* is not sufficient to develop a truly data-driven perspective on the question. In addition, because the filing approach adopted by USAC described in III.2 above does not provide USAC or the Bureau with complete data on what applicants are actually buying to upgrade their LAN / Wi-Fi networks, any analysis based on publicly available data is likely to be incomplete or of an insufficient sample size.

Fortunately, the Bureau has another E-rate cycle before its report is due. This provides the opportunity to both correct the filing approach issues in III.2 and give the Bureau the time needed to develop a robust record. Based on our collective experience in working with E-rate data, it is without question that developing a robust record will require a significant investment in contacting applicants to ensure that the Bureau has a complete and accurate understanding of their upgrade projects. This is something that cannot be accomplished in the six weeks allotted in the Public Notice.

CoSN, EducationSuperHighway and Funds for Learning are committed to helping the Bureau develop a robust record on the sufficiency of Category Two budgets and we will continue our work over the coming E-rate cycle to collect and verify the data required to create this record. We urge the Bureau to extend the data collection time for this Public Notice through Funding Year 2018 so that the Commission is in a position to make a well supported decision as to the sufficiency of Category Two budgets and thereby make appropriate adjustments for the E-rate program beginning in funding year 2020.

CONCLUSION

E-rate modernization has been a tremendous success in meeting the Commission's goal of providing more equitable funding for broadband within schools and libraries and in increasing

the number of schools with robust LAN / Wi-Fi networks. However, to reach its goal of closing the K-12 digital divide, the Commission must reaffirm that applicants will have through funding year 2019 to use their Category Two budgets and take immediate action to address several administrative issues that are making it difficult for applicants to use their budgets. In addition, because it is clear that the current Category Two budgets are not sufficient for some applicants, the Bureau should continue its data collection through funding year 2018 in order to enable the Commission to utilize an effective, data-driven decision making process as to the future of Category Two budgets after funding year 2019.

Respectfully submitted,

Keith Krueger
CoSN

Evan Marwell
EducationSuperHighway

John Harrington
Funds For Learning

Date: October 23, 2017

APPENDIX A

Worcester Public Schools E-rate Category 2 budget 2015-2016

School budgets for eligible funding

Name	Budget	Total Eligible	PreK	Total Eligible	District portion 15% of eligible plus PreK allocation	Total district portion	Erate portion	Drop Cost					
			.1605% Allocation (see comment)				85% of eligible	Drop cost at each school	AP drops per school	PreK drop cost	Access point wiring	PreK	Amount over project budget
Belmont	$ 79,800.00	$79,800.00	$131.07	$79,800.00	$12,101.07	$14,211.01	$67,830.00	$525.00	58	$0.84	$30,450.00	$48.87	$2,109.94
Burncoat Elem	$ 33,450.00	$33,450.00	$55.73	$33,450.00	$5,073.23	$6,495.01	$28,432.50	$425.00	25	$0.68	$10,625.00	$17.05	$1,421.78
Burncoat High	$ 139,950.00	$139,950.00	$237.18	$139,950.00	$21,229.68	$30,156.99	$118,957.50	$625.00	83	$1.00	$51,875.00	$83.26	$8,927.31
Canterbury	$ 52,050.00	$52,050.00	$88.79	$52,050.00	$7,896.29	$11,339.50	$44,242.50	$425.00	40	$0.68	$17,000.00	$27.29	$3,443.21
Chandler Elem	$ 57,300.00	$57,300.00	$93.39	$57,300.00	$8,688.39	$9,789.51	$48,705.00	$625.00	35	$1.00	$21,875.00	$35.11	$1,101.12
City View	$ 68,550.00	$68,550.00	$112.17	$68,550.00	$10,394.67	$11,987.50	$58,267.50	$425.00	52	$0.68	$22,100.00	$35.47	$1,592.83
Columbus Park	$ 60,600.00	$60,599.74	$100.83	$60,599.74	$9,190.79	$11,632.22	$51,509.78	$525.00	40	$0.84	$21,000.00	$33.71	$2,441.43
Elm Park	$ 66,150.00	$66,150.00	$109.40	$66,150.00	$10,031.90	$12,255.00	$56,227.50	$625.00	41	$1.00	$25,625.00	$41.13	$2,223.10
Fanning Learning Center	$ 11,700.00	$11,386.74	$18.26	$11,386.74	$1,726.27	$1,726.27	$9,678.73	$425.00	10	$0.68	$4,250.00	$6.82	
Gerry Creamer	$ 34,350.00	$34,350.00	$55.14	$34,350.00	$5,207.64	$5,374.50	$29,197.50	$425.00	26	$0.68	$11,050.00	$17.74	$166.86
Goddard	$ 66,600.00	$66,600.00	$128.85	$66,600.00	$10,118.85	$24,045.50	$56,610.00	$225.00	77	$0.36	$17,325.00	$27.81	$13,926.65
Grafton St	$ 50,250.00	$50,250.00	$83.92	$50,250.00	$7,621.42	$9,864.01	$42,712.50	$625.00	29	$1.00	$18,125.00	$29.09	$2,242.59
Lincoln St	$ 37,350.00	$33,526.13	$53.37	$33,526.13	$5,082.29	$5,082.29	$28,497.21	$725.00	17	$1.16	$12,325.00	$19.78	
Quinsigamond	$ 112,050.00	$110,997.58	$177.42	$110,997.58	$16,827.06	$16,827.06	$94,347.94	$695.00	70	$1.12	$48,650.00	$78.08	
South High	$ 178,200.00	$178,199.04	$317.96	$178,199.04	$27,047.81	$47,832.82	$151,469.18	$625.00	118	$1.00	$73,750.00	$118.37	$20,785.01
Sullivan Middle	$ 125,700.00	$125,699.77	$214.58	$125,699.77	$19,069.55	$27,791.17	$106,844.80	$225.00	128	$0.36	$28,800.00	$46.22	$8,721.62
Vernon Hill	$ 67,950.00	$67,950.00	$112.52	$67,950.00	$10,305.02	$12,597.50	$57,757.50	$325.00	62	$0.52	$20,150.00	$32.34	$2,292.48
Worcester East	$ 116,400.00	$116,399.74	$189.36	$116,399.74	$17,649.32	$19,835.68	$98,939.78	$325.00	96	$0.52	$31,200.00	$50.08	$2,186.36
	$ 1,358,400.00	$ 1,353,208.74	$ 2,279.94	$ 1,353,208.74	$205,261.25	$ 278,843.54	$ 1,150,227.43		1,007	$14.12	$466,175.00	$748.22	$ 73,582.29
Total FRN		$ 1,150,227.43											
District Portion		$ 278,843.54											
Total Project (includes over Erate budget)		$1,429,070.97											

Line item budgets per school for networking components

	Model Name	9406-4a6 Zl 2930-24G switch	2930-24G switch	IE30	Zl 10GBT 8 port	Zl 5FP+8 port 2 port	Zl 20 GT 2 port 5FP+	Zl 24 GT	10G SR Optic	10G LRM Optic	Zl Power supply	5412-92ZL switch	2920 SFP+	2920 10GT	2810-24G	Wall Rack	Floor Rack	MB26	MB34	Patch Cables	Fiber Cables	Hardware Total Per School	Wiring Per School	Install Per School	PreK Cost Allocation - off wiring	Erate Reduction to Meet Budget	Total per school
PreK?	Part Number	J9523A	J9777A	J9802A	J9546A	J9538A	J9536A	J9554A	J9150A	J9152A	J9306A	J9502A	J9731A	J9732A	J9850-24G	AR3080-D	AR2101	AR826	AR834								
N	Burncoat Middle	$0.00	$4,944.28	$0.00	$2,171.27	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,974.48	$0.00	$1,383.64	$0.00	$0.00	$39,752.50	$288.00	$0.00	$41,314.17	$25,650.00	$1,125.00		($2,939.17)	$86,350.00
Y	Chandler Magnet	$0.00	$2,172.14	$6,791.90	$0.00	$0.00	$1,720.18	$0.00	$1,223.52	$0.00	$0.00	$0.00	$980.24	$0.00	$0.00	$927.88	$0.00	$39,138.75	$0.00	$204.00	$324.00	$49,806.91	$25,950.00	$745.00	($600.00)		$77,101.91
Y	Clark Street	$0.00	$0.00	$270.76	$0.00	$0.00	$0.00	$2,963.88	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$927.88	$0.00	$21,966.25	$0.00	$144.00	$0.00	$25,472.77	$18,500.00	$280.00	($300.00)		$38,752.77
N	Doherty High	$7,700.00	$3,774.63	$0.00	$0.00	$3,952.12	$0.00	$14,819.40	$4,282.32	$0.00	$1,036.08	$7,325.00	$2,466.10	$0.00	$10,780.00	$1,855.76	$0.00	$0.00	$85,773.75	$3,452.00	$546.00	$153,295.16	$47,725.00	$4,335.00		($565.16)	$204,750.00
N	Flagg St	$7,700.00	$0.00	$135.38	$0.00	$0.00	$0.00	$2,963.88	$811.76	$0.00	$1,036.08	$0.00	$0.00	$0.00	$0.00	$1,855.76	$0.00	$26,350.75	$0.00	$408.00	$78.00	$40,297.61	$21,000.00	$380.00			$82,077.61
N	Forest Grove	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$108,976.25	$0.00	$0.00	$108,976.25	$32,300.00	$0.00		($3,976.25)	$138,300.00
Y	Gates Lane	$0.00	$0.00	$0.00	$2,171.27	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,480.86	$1,480.86	$4,900.00	$1,383.64	$0.00	$49,522.50	$0.00	$720.00	$0.00	$82,059.13	$25,750.00	$3,455.00	($300.00)	($64.13)	$92,700.00
N	Heard St	$8,850.00	$2,172.14	$135.38	$0.00	$0.00	$0.00	$1,481.94	$611.76	$0.00	$543.04	$0.00	$486.62	$0.00	$0.00	$1,855.76	$0.00	$14,977.50	$0.00	$648.00	$78.00	$25,147.14	$17,150.00	$380.00			$48,127.14
Y	Hiatt Magnet	$0.00	$2,172.14	$0.00	$0.00	$0.00	$0.00	$0.00	$1,223.52	$0.00	$0.00	$0.00	$967.24	$0.00	$0.00	$1,383.64	$0.00	$32,748.75	$0.00	$144.00	$156.00	$89,015.29	$22,700.00	$780.00	($300.00)	($495.29)	$91,300.00
N	Lakeview	$8,850.00	$0.00	$541.52	$0.00	$0.00	$0.00	$2,963.88	$0.00	$0.00	$543.04	$0.00	$0.00	$0.00	$0.00	$0.00	$328.78	$0.00	$33,275.00	$276.00	$0.00	$27,578.20	$15,500.00	$530.00			$43,308.20
N	May St	$8,850.00	$0.00	$541.52	$0.00	$0.00	$0.00	$1,481.94	$0.00	$0.00	$543.04	$0.00	$0.00	$0.00	$0.00	$527.88	$0.00	$0.00	$22,186.25	$204.00	$0.00	$29,314.63	$15,475.00	$525.00			$43,304.63
Y	McGrath	$0.00	$1,086.07	$0.00	$0.00	$0.00	$0.00	$1,481.94	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,767.50	$0.00	$144.00	$0.00	$23,479.51	$13,000.00	$265.00	($300.00)		$36,144.51
N	Midland St	$8,850.00	$0.00	$473.83	$0.00	$0.00	$0.00	$2,963.88	$0.00	$0.00	$543.04	$0.00	$0.00	$0.00	$0.00	$527.88	$0.00	$15,176.25	$0.00	$276.00	$0.00	$23,830.88	$12,375.00	$365.00			$38,690.88
N	New Citizens Center	$0.00	$0.00	$270.76	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$527.88	$0.00	$10,383.75	$0.00	$0.00	$0.00	$11,182.38	$7,000.00	$250.00			$18,483.38
Y	Norrback	$0.00	$3,258.21	$135.38	$0.00	$1,976.06	$0.00	$1,481.94	$0.00	$2,447.54	$0.00	$0.00	$1,480.86	$0.00	$0.00	$0.00	$0.00	$42,833.75	$0.00	$288.00	$0.00	$54,381.74	$25,650.00	$575.00	($500.00)		$79,306.34
N	North High	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17,783.28	$0.00	$4,045.50	$1,881.28	$17,825.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$108,976.25	$2,244.00	$0.00	$173,475.71	$34,700.00	$930.00		($155.71)	$237,950.00
N	Rice Square	$8,850.00	$1,086.07	$0.00	$0.00	$0.00	$0.00	$4,445.82	$611.76	$0.00	$543.04	$0.00	$485.62	$0.00	$0.00	$1,855.76	$0.00	$0.00	$29,021.25	$420.00	$78.00	$38,605.32	$25,800.00	$980.00		($60.32)	$84,800.00
Y	Roosevelt	$0.00	$3,430.35	$0.00	$0.00	$1,976.06	$0.00	$0.00	$0.00	$4,045.50	$0.00	$0.00	$2,466.10	$0.00	$8,020.00	$0.00	$0.00	$51,918.75	$0.00	$1,656.00	$0.00	$76,315.16	$20,500.00	$2,460.00	($300.00)	($3,725.16)	$94,050.00
N	Tatnuck	$8,850.00	$2,172.14	$0.00	$0.00	$0.00	$0.00	$4,445.82	$1,223.52	$0.00	$543.04	$0.00	$967.24	$0.00	$2,450.00	$1,855.76	$128.78	$23,163.75	$0.00	$852.00	$156.00	$41,028.03	$21,000.00	$1,425.00		($369.03)	$63,150.00
N	Thorndyke	$8,850.00	$3,172.14	$0.00	$0.00	$0.00	$0.00	$1,481.94	$611.76	$0.00	$543.04	$0.00	$485.62	$0.00	$0.00	$527.88	$0.00	$26,767.50	$0.00	$348.00	$78.00	$30,879.88	$23,300.00	$380.00		($603.88)	$54,300.00
N	University Park	$8,850.00	$0.00	$67.69	$0.00	$0.00	$0.00	$7,963.88	$0.00	$0.00	$543.04	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17,347.50	$276.00	$0.00	$25,048.11	$11,000.00	$265.00			$36,253.11
N	Waverly Alternative	$0.00	$0.00	$270.76	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$270.76	$8,800.00	$100.00			$9,170.76
N	Wawecus Rd	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$927.88	$0.00	$13,976.75	$0.00	$0.00	$0.00	$14,904.63	$6,300.00	$100.00		($204.63)	$22,000.00
Y	West Tatnuck	$8,850.00	$1,086.07	$0.00	$0.00	$0.00	$0.00	$1,481.94	$611.76	$0.00	$543.04	$0.00	$485.62	$0.00	$490.00	$0.00	$0.00	$20,767.50	$0.00	$348.00	$78.00	$29,749.93	$14,550.00	$420.00	($300.00)	($269.93)	$44,400.00
Y	Worcester Arts	$8,850.00	$2,172.14	$744.59	$0.00	$0.00	$0.00	$4,445.82	$611.76	$0.00	$543.04	$0.00	$485.62	$0.00	$0.00	$1,855.76	$0.00	$19,963.75	$0.00	$492.00	$78.00	$34,425.48	$21,275.00	$1,085.00	($300.00)		$56,315.48
N	Chandler Elem Annex	$0.00	$1,086.07	$676.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$328.78	$0.00	$4,818.75	$72.00	$0.00	$6,782.48	$6,250.00	$550.00			$13,582.48
	Totals	$83,900.00	$40,184.99	$4,941.37	$4,342.54	$7,904.24	$1,720.18	$83,451.18	$11,823.44	$10,539.54	$11,481.84	$45,150.00	$13,327.74	$1,455.34	$27,440.00	$14,703.64	$786.28	$422,535.75	$449,107.50	$13,644.00	$1,480.00	$1,207,952.97	$609,850.00	$31,385.00	($4,500.00)	($19,819.66)	$1,754,888.31
																						$530,350.00	$1,733,187.97	$1,730,667.97	$1,754,888.31	
																							$1,457,688.81	$1,457,688.81	$1,457,688.81	State Funds
																						DISTRICT PAID	$277,349.66	$273,649.66	$277,549.66	District Portion

APPENDIX B

In response to the Bureau's Public Notice, EducationSuperHighway, CoSN, AdTech, CMorton Associates LLC, ESC12, and AGL Consulting sent short surveys to school districts that have spent 0-15% and 85-100% of their E-rate Category 2 budgets since the 2015 (the first E-rate cycle post-modernization).

0-15%
We received responses from 142 E-rate applicants

If you have not spent your available Category 2 budget, do you plan to by 2020?

Response:	Total	%
Yes	112	79%
No	4	3%
Unsure	26	18%
Total	**142**	**100%**

85-100%
We received responses from 26 E-rate applicants

Did you use Category 2 funding to upgrade your school district's internal wiring?

Response:	Total	%
Yes	15	58%
No	11	42%
Total	**26**	**100%**

If you could improve your Category 2 upgrade experience, what would you improve and why?

(Free response. Quotes included in comments)

Please also share any additional purchases made to support your internal network

(Free response. Quotes included in comments)

Additional data collection

We will continue to collect data on Category 2 usage and share that information with the FCC and the Bureau.

APPENDIX C

District size and locale classification (EducationSuperHighway)

DISTRICT SIZE CLASSIFICATIONS	
DESCRIPTION	**# OF SCHOOLS**
Tiny	1
Small	2-5
Medium	6-15
Large	16-50
Mega	51+

LOCALE CLASSIFICATIONS	
DESCRIPTION	**LOCALE CODE FROM NCES**
Urban	11 - City-Large, 12 - City-Midsize, 13 - City-Small
Suburban	21 - Suburb-Large, 22 - Suburb-Midsize, 23 - Suburb-Small
Small Town	31 - Town-Fringe, 32 - Town-Distant, 33 - Town-Remote
Rural	41 - Rural-Fringe, 42 - Rural-Distant, 43 - Rural-Remote