

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

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

**Reply Comments of Funds For Learning, LLC
on Making the Category Two Budget Approach Permanent and Other
Modifications to the Category Two Budget Approach**

Funds For Learning[®] (FFL) supports the Commission’s proposed rule to make the Category Two (C2) Budget Approach permanent. There is robust support for this action, and the Comments and Reply Comments in this docket are remarkably consistent. The E-rate discount program is succeeding in its mission to bring broadband connectivity into our nation’s schools and libraries, connecting students and library patrons with vital broadband Internet access – and Category Two funding is a vital link in achieving this goal.

In these Reply Comments, FFL will provide additional context to three specific items being discussed amongst the E-rate community in this proceeding: (1) the impact of increasing budget floors and other budget factors; (2) the eligibility of all data infrastructure; and (3) the scope of “district-wide” budgets as it relates to entities other than public school districts.

**HIGHER BUDGET FACTORS WILL ALLOW \$131.8 MILLION MORE PER YEAR IN E-RATE
DISBURSEMENTS TO BE INVESTED IN ON-CAMPUS NETWORKS**

Included as an attachment to these Reply Comments is an analysis of the impact increased budget factors will have on the availability of E-rate discount for schools and libraries. Using historical demand for E-rate discounts as a guide, including utilization rates and the number of sites that “maxed out” their C2 budgets from 2015 to 2019, FFL estimates the current budget system deprived schools and libraries of \$1.13 billion in eligible discounts over the past five year. Adopting a budget floor of \$30,000 per site, plus \$260 per student schools and \$6 per square foot in libraries, will allow all schools and libraries to meet their needs. The current budget amounts unfairly discriminate against small sites and older buildings which are more expensive to upgrade.

Based on insight gained from 100 simulations, it is estimated that the proposed budget changes will have the following impacts:

- Adopting system wide budgets (“consolidated budgets”) will provide \$470.6 million in additional support over a five-year period, or \$94.1 million per year.
- The proposed higher budget factors will result in an additional \$659.0 million in support over a five-year period, or \$131.80 million per year. This is in addition to the enhanced investment resulting from consolidated budgets.

Adopting the consolidated budgets and increasing the budget factors will provide the most help to the applicants who need help the most. Consolidated budgets themselves are not enough because they do not assist individual school sites, nor do they account for disparities that often exist between school districts.

We believe that these estimates are on the high-end of the actual outcomes the FCC can anticipate. If five years of C2 data teaches us anything, it teaches us that schools and libraries purchase what they *need*. For the majority of school and library sites, having a higher budget would not have had an impact on their purchasing decisions over the past five years. But for those who needed it, the higher budget factors would have made a significant difference. The utilization of E-rate discounts is well within the program’s overall annual budget cap. The FCC has the power and authority to increase the budget factors and provide much needed support to a small percentage of sites that need it the most.

SERVICES THAT ENABLE, SECURE, AND MANAGE APPLICANT LOCAL AREA NETWORKS SHOULD BE ELIGIBLE

The E-rate program’s current eligible services framework has served it well. But with a few slight improvements, the Commission can reduce complexity, increase competition, and provide an unambiguous framework for determining eligibility despite a rapidly changing network technology marketplace.

Funds For Learning believes there should be **zero** ineligible data network infrastructure. To the extent that an applicant identifies solutions which will allow its local area network to function reliably, securely, or efficiently, the hardware, software, and service components required to implement that solution should qualify for Category Two funding. We believe there are three major components to a reliable and cost-effective infrastructure: enabling connectivity, securing data transmission, and ensuring reliable and efficient operation.

ENABLING CONNECTIVITY

We feel that the current Eligible Services List effectively identifies the major “building blocks” required to establish local area network connectivity: switching, routing, wireless LAN components, and structured cabling. The current framework also includes (and should continue to include) accessories and related components required for operation, such as antennas, connectors, software licensing, and equipment racks and mounting hardware.

We feel the Eligible Services List could benefit from a stipulation that technologies which are *functionally equivalent* to the hardware components contained therein can be eligible in the same manner as explicitly listed hardware. With the advent of solutions like software-defined networking, infrastructure-as-a-service, SD-WAN, and other virtualized network functions, the definitions in the Eligible Services List will never be able to keep up with the rapid evolution of networking technology. But we don’t believe it has to – put simply, if basic router hardware is eligible for Category Two funding, any other technology which performs functionally equivalent routing should qualify in the same manner, assuming cost-effectiveness. We believe that the program’s current position of technological neutrality supports this construct, but to “future proof” the eligible services framework we feel it would be helpful for the Commission to remind stakeholders that any technological implementation of an eligible function (physical or virtual, on-premise or cloud-based) should be eligible for funding.

SECURING DATA TRANSMISSION

Funds For Learning concurs with the numerous commenters¹ who support the inclusion of more “advanced” data network security solutions in the program’s eligible services framework. While the goals of protecting sensitive student data and shielding applicants from ransomware and other threats are laudable (and we share those concerns), we feel that the true issue is ultimately less nuanced: networks damaged by an attack are not functional, and attacks against networks are rapidly increasing in frequency and complexity. We posit, therefore, that network security *is* network infrastructure, and the program should treat it as such.

While “basic” firewall hardware is still sold and should continue to be eligible, it is no longer enough to ensure reliable operation of the network sitting behind the firewall. In fact, we would argue in 2019, the practical definition of a firewall is a multi-function network security appliance. When applicants and service providers refer to “the firewall,” they are referring to the system which not only does basic port blocking, but also actively prevents specific attack vectors like DDoS (distributed denial-of-service), MitM (man-in-the-middle), and phishing

¹ See comments from the E-rate Management Professionals Association, State E-rate Coordinators' Alliance/Schools, Health & Libraries Broadband Coalition, EducationSuperHighway, Kentucky Department of Education, The State of South Carolina, and numerous others.

attacks. Further, many modern security appliances also include basic URL or content filtering functions, as well deep packet inspection, authentication, and analytics.

While network security solutions are typically marketed as attempts to ensure the security of sensitive data, at a more basic level they all strive to prevent the disruption of basic network connectivity. As a result, we feel it is prudent to regard securing the network as integral to its operation as maintaining its basic components, and services which perform this function should qualify for Category Two funds.

MANAGING NETWORK CONNECTIVITY

The third aspect of a reliable network involves analyzing, adjusting, and configuring its components in order to ensure that data flows as efficiently as possible. Effective network management and monitoring promotes cost-effective purchasing by helping network administrators discover where and when hardware or software upgrades are required, while also increasing network uptime and reliability by proactively identifying bottlenecks and other network problems which can lead to a disruption in service.

In funding Managed Internal Broadband Services (MIBS) since Funding Year 2015, the Commission has recognized the benefit of a properly managed and monitored network. In the interest of technological neutrality, we feel it appropriate to include applicant-owned network management and monitoring components in the program's Eligible Services List. It should also be noted that the lines between network management and monitoring and basic network maintenance have always been blurry, but these types of services continue to become more and more integrated as manufacturers move to software subscription and support models.

Taken together, solutions which enable connectivity, secure that connectivity, and properly manage that connectivity are required in order to ensure that broadband connectivity is established inside schools and libraries. A network which is non-functional due to a security attack does not accomplish this goal. A network which is notoriously unreliable because it is not properly managed does not accomplish this goal. As school and library networks become more and more sophisticated, all three elements must ultimately work in harmony in order to ensure that broadband connectivity is consistently delivered to end users.

DECREASING COMPLEXITY; INCREASING COMPETITION

Another reason the eligible services framework must change is that the market for network components – how connectivity is configured and sold – is changing rapidly. Network equipment manufacturers continue to seek recurring sources of revenue, resulting in more and more software licensing, subscription arrangements, and maintenance options than ever before. Consider the following example for the purchase of a firewall. In each case, the vendor's

firewall solutions are directly competitive with one another both in terms of networking capacity/throughput and list price:

- **Vendor A** offers a next-generation firewall with integrated software and a lifetime warranty and service agreement. Its solutions are fully integrated, and no additional software subscriptions or maintenance services are necessary. The solution includes intrusion prevention (IDS/IPS), URL filtering, device onboarding/authentication services, lifetime replacement of defective hardware, and security management and monitoring software. Because Vendor A does not separate a cost for their software (or the specific features/functions therein), per the E-rate program's Ancillary Use rule their solution can be discounted as 100% eligible because there is no way to identify a cost or value for certain features currently designated as ineligible.
- **Vendor B** also offers a next-generation firewall with capacity specifications virtually identical to Vendor A's firewall. But Vendor B requires that a separate software license be purchased in order for the firewall to function. Vendor B offers two versions of their software license: Basic and Advanced. The Basic license enables operation of the hardware and basic port blocking. The Advanced license adds IPS/IDS, content filtering, and a management/monitoring utility. In this scenario, if an applicant chooses Vendor B's Advanced solution, under current rules a cost-allocation is required (typically, the cost difference between the minimum-level Basic license and the Advanced license would be cost-allocated.) In practice, this means that solutions sold like Vendor B's could be anywhere from 50% to 80% eligible for discounts depending on component pricing.
- **Vendor C's** hardware is functionally similar to both Vendor A's and Vendor B's. But Vendor C sells multiple components separately: the hardware, three software license options (bronze/silver/gold), a security management and monitoring program, and a support contract which provides software updates and technical support. Because each component is separately priced, current rules require cost-allocation of any component which adds additional ineligible functionality; in practice, solutions sold this way can range from 40% to 60% eligible for E-rate discounts.

Neither Vendors A, B, or C package their solutions differently for the K-12 market as they would for small business, enterprise, or any other market sector. Further, from a technical perspective Vendor B's solution (with their Advanced license) and Vendor C's solution (when the gold license, monitoring program, and maintenance agreement are optioned) are all *functionally equivalent and directly competitive* with Vendor A's solution. But current E-rate rules do not treat them that way – they incentivize applicants to go with Vendor A's solution, since it is: a) funded at the highest level; and, b) results in a much simpler funding application since no complicated cost-allocations are required.

This phenomenon is not only limited to firewalls or network security solutions. In the past five years, there has been a *significant* increase in the segmentation of hardware and

software for networking equipment, with the software both moving to a subscription/license model and increasing in features and functions. Even equipment as basic as a 48-port closet switch may now include some advanced security features, monitoring licenses which integrate it with network-wide management systems, and more. We expect this trend to continue.

For competing vendors to have a level playing field the E-rate program must treat competitive solutions equally. This cannot occur when arcane and dated E-rate rules provide more funding for some solutions than others, especially when those solutions are otherwise functionally equivalent. Funds For Learning supports a clear and unambiguous line between eligible and ineligible components. Right now, however, the network infrastructure market has shifted to licensing solutions and feature sets which sit directly on top of that line. This causes confusion among applicants and vendors as to what portions of any given solution are eligible. It has also resulted in significant inconsistencies in the administrators' funding decisions (with many examples of the same product being funded in some cases, denied in others, and cost-allocated at varying percentages in still others.) Ensuring that the eligible services framework allows for building, securing, and managing data networks creates a level playing field for competition while simultaneously decreasing program complexity and future-proofing the Eligible Services List for years to come.

PRIVATE SCHOOLS SHOULD NOT BE REQUIRED TO USE CONSOLIDATED BUDGETS

The comments reflect widespread support for moving from site-by-site to district wide or system wide budgets ("consolidated budgets"). As many commentators point out, consolidated budgets will greatly simplify the C2 application process and reduce the time needed to process applications. This, in turn, will allow funds to be committed and disbursed in a timelier manner. Consolidated budgets also will provide school districts and library systems with the flexibility to allocate budgeted dollars in a manner that best meets their unique technology needs. Essentially, by adopting consolidated budgets, the Commission and USAC will be "stepping out of the way" of the normal budgeting process, thereby allowing decision-making to occur where it should occur – at the local level, without government-imposed constraints on how funds can be used at each site within a school district or library system.

Notwithstanding the benefits of district-wide budgets, it is important to recognize that not all E-rate applicants can apply, or want to apply, as school districts. For example, today some private school systems apply as school districts, others apply through consortia, and others apply individually on a school-by-school basis. There are various reasons why entities may favor one approach over another. Ultimately, the Commission should preserve the flexibility of non-traditional entities to apply for C2 funding in a manner that best suits their unique needs – whether as a school district, a consortium, or as an individual school.

Respectfully submitted,

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Universal Service Funding for Schools and Libraries

Estimate of E-rate Category Two
Funding Utilization Using New Budget Factors

FY2015 to FY2019

Presented to:

Federal Communications Commission

September 3, 2019

Prepared by:



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1. Introduction

What would happen if the E-rate Category Two budget factors were different? What if the budget floor was lifted for small school and library sites? What if the per student factor was increased for schools or the per square foot factor was raised for libraries?

This report is intended to help answer these questions. Although we cannot travel into the future, there is a rich set of historical data that we can use to estimate the impact of these changes if they had been implemented during the past five years.

In our previous study¹, there were two areas that stood out. First, small sites, those with the lowest budgets, had utilization rates well below the average:

- 41.3% of very small schools had no C2 utilization²
- 60.5% of very small rural libraries had no C2 utilization³
- 66.3% of very small urban libraries had no C2 utilization⁴

Second, for sites with budgets above the minimum floor, there was an even distribution of costs from site-to-site when measured on a per student or per square foot basis; however, near the maximum budget amounts, there was a higher than normal concentration of sites, suggesting that there was need for additional E-rate discounts (i.e. above the budget cap) at those locations:

- 37.0% of schools “maxed” their per student budget⁵
- 3.9% of rural libraries “maxed” their per square foot budget⁶
- 4.2% of urban libraries “maxed” their per square foot budget⁷

In this analysis, we will estimate what the impact would have been if the FCC had set the budget floor and per student/per square foot budget factors at a higher level for the past five years.

¹ Funds For Learning has previously reported on the utilization of Category Two (C2) budgets from 2015 to 2019. See <https://ecfsapi.fcc.gov/file/108162826412441/C2%20NPRM%20Data%20Report%20-%20Funds%20For%20Learning.pdf>

² *ibid.*, Table 24: Schools without C2 Requests and Average C2 Received by Sites with Requests

³ *ibid.*, Table 27: Rural Libraries without C2 Requests and Average C2 Received by Sites with Requests

⁴ *ibid.*, Table 28: Urban Libraries without C2 Requests and Average C2 Received by Sites with Requests

⁵ *ibid.*, Table 25: Count of Individual School Sites by Per Student Budget Utilization and Student Enrollment

⁶ *ibid.*, Table 29: Count of Rural Library Sites by Per Sq. Ft. Budget Utilization and Square Footage

⁷ *ibid.*, Table 30: Count of Urban Library Sites by Per Sq. Ft. Budget Utilization and Square Footage

2. FY2015 to FY2019 School C2 Budget Utilization

111,963 school sites have had the opportunity to apply for C2 discounts. Between FY2015 and FY2019, it is estimated that a total of \$4.26 billion in E-rate discounts will be disbursed. Combined with applicants' payments of \$1.61 billion, a total of \$5.874 billion will have been invested in on-campus broadband at schools.

Table 1: Count of School Sites and Budget Utilization by Budget Usage (FY2015-2019)

Budget Usage Range	Site Count	E-rate Discounts	Applicant Payment	Total Budget Utilization
FLOOR	12,075	\$36,256,228	\$10,519,592	\$46,775,820
\$0 to \$24.99	15,950	\$28,195,646	\$14,623,954	\$42,819,600
\$25 to \$49.99	5,631	\$80,763,395	\$43,260,633	\$124,024,028
\$50 to \$74.99	6,430	\$156,179,381	\$79,780,385	\$235,959,766
\$75.00 to \$99.99	7,983	\$282,489,709	\$129,798,687	\$412,288,396
\$100.00 to \$124.99	9,083	\$421,345,284	\$177,113,045	\$598,458,329
\$125.00 to \$149.99	12,162	\$708,601,431	\$260,480,981	\$969,082,412
\$150.00 or more	42,649	\$2,546,621,894	\$898,673,473	\$3,445,295,367
Total	111,963	\$4,260,452,968	\$1,614,250,750	\$5,874,703,718

The following two figures illustrate the distribution of site counts and E-rate discounts based on the amount of budget used at each school site. For example, there were 6,430 school sites that utilized a per student budget amount ranging between \$50.00 and \$74.99 per student. For these specific sites, the total on-campus expenditure was \$235,959,766; the E-rate program provided discounts of \$156,179,381; and applicants paid a total of \$79,780,385.

Figure 1: Count of School Sites by Budget Utilization Range (FY2015-2019)

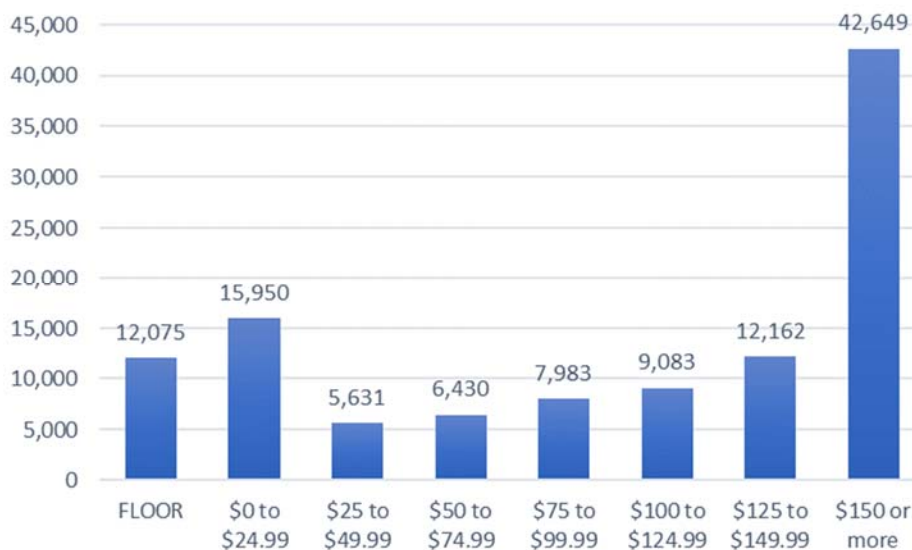


Figure 2: E-rate Discounts by School Budget Utilization Range (FY2015-2019)



BUDGET FLOORS

School sites that qualified for the minimum budget (a.k.a. the “floor”) represented only \$36.2 million in E-rate discounts from 2015 to 2019. Across the board, smaller school sites were far less likely to apply for C2 discounts than larger sites (i.e. those with a total budget of \$30,000 or more.)

Table 2: Count of School Sites Applying for C2 by Budget Floor or Another Amount (FY2015-2019)

Site Budget Amount	Total Site Count	Using C2	Not Using C2	% not using C2	Avg Budget Util of Sites Using C2 \$
Floor	12,075	6,966	5,109	42.3%	68.6%
Between floor & \$30,000	14,792	11,741	3,051	20.6%	78.8%
\$30,000 or more	85,096	77,695	7,401	8.7%	69.2%
Total	111,963	96,402	15,561	13.9%	75.6%

The lower number of C2 funding requests at smaller sites does not appear to be related to the actual technology needs of these locations. The lower application rate is most likely tied to the amount of support that is available. Therefore, we assume that an increased budget floor will translate into more of the smaller school sites submitting applications. For purposes of this analysis, the budget floor will be set at \$30,000 per site.

PER STUDENT FACTOR

As shown in our previous analysis⁸, there is an even distribution of school sites utilizing various amounts of per student budget levels up until reaching the per student budget cap. At the maximum

⁸ *ibid.*, Table 25: Count of Individual School Sites by Per Student Budget Utilization and Student Enrollment

per student level, the number of sites jumps, indicating that many of those sites required additional funding but were prohibited from requesting it.

The trendline for this data suggests that there is a natural ceiling to the per student spending that occurs. It appears that all but a few projects would be adequately supported by a per student budget factor of \$260.

ESTIMATING "REAL" SCHOOL DEMAND

The real demand from 2015 to 2019 is estimated on the following page. The demand is based on the following factors and assumptions:

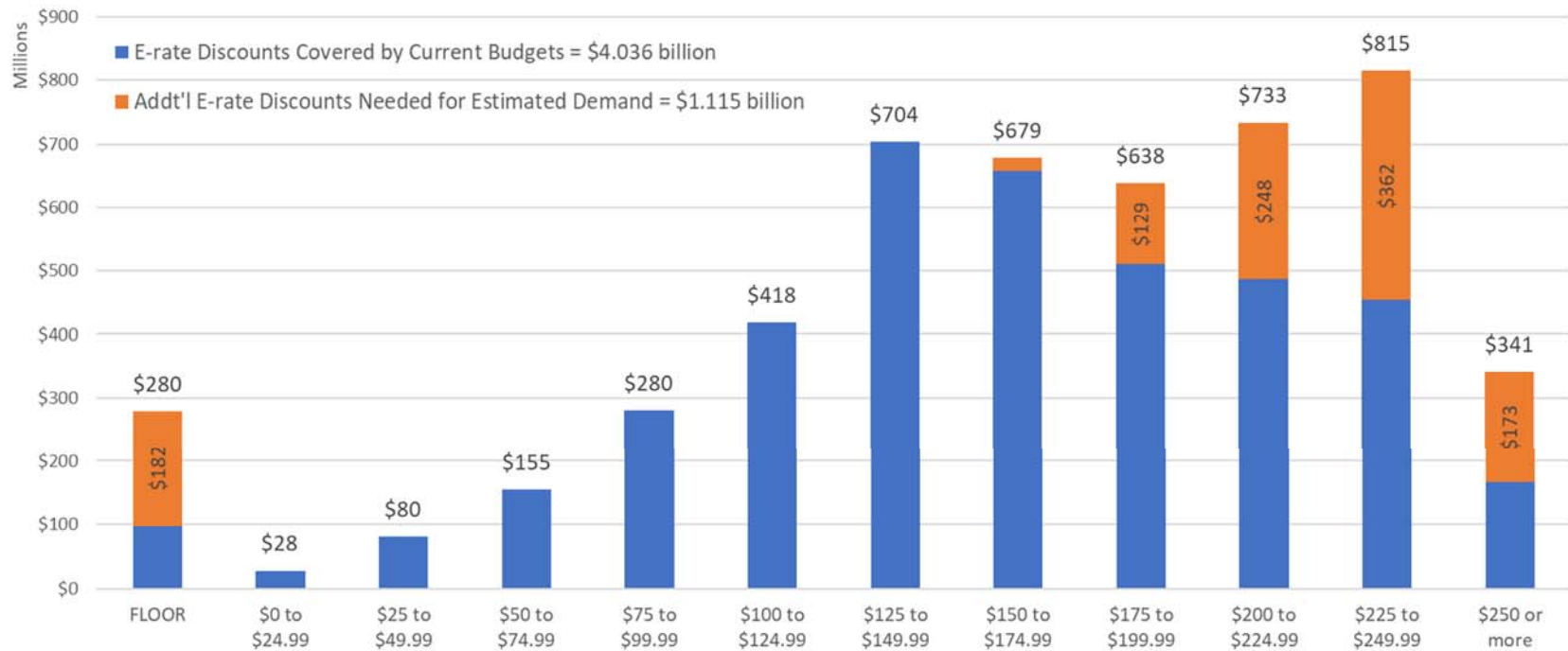
- The school budget floor will be set at \$30,000. A higher percentage of sites that qualify for the budget floor will apply for C2. Instead of 42.3% of these sites not applying, it is assumed that only 8.7% of these sites will not apply. This corresponds to the percentage of sites with budgets at or above \$30,000 that currently do not apply.
- The per student budget factor will be set at \$260. It is assumed that current sites with a utilization rate of 98% or more of its C2 budget have need of additional funding. The specific amount of funding needed is assumed to be evenly distributed between \$160 and \$260 per student. For example, if a school site had utilized all 100% of its C2 per student budget, an additional project cost is assumed, based on a random number between \$1 and \$100 per student.
- Because it uses random numbers, real demand was simulated 100 separate times. The average of these simulations is the result presented on the following page.

The result is an additional \$1.115 billion in E-rate discounts being requested over a five year period, or an annual average increase of \$223 million in E-rate discounts.

Table 3: Estimate of Actual School Site Budget Requirements (FY2015 to FY2019)

	FLOOR	\$0 to \$24.99	\$25 to \$49.99	\$50 to \$74.99	\$75 to \$99.99	\$100 to \$124.99	\$125 to \$149.99	\$150 to \$174.99	\$175 to \$199.99	\$200 to \$224.99	\$225 to \$249.99	\$250 or more	TOTAL
Site Count	18,602	14,066	5,342	6,126	7,584	8,689	11,643	10,312	8,664	8,776	8,710	3,449	111,963
Actual Budget Req.	\$363.8	\$42.5	\$123.1	\$234.3	\$409.2	\$594.5	\$962.7	\$912.2	\$866.4	\$994.9	\$1,104.5	\$464.1	\$7,072.1
Discount Needed	\$279.7	\$27.9	\$80.0	\$154.9	\$280.1	\$418.3	\$703.7	\$679.1	\$638.4	\$733.4	\$815.1	\$340.6	\$5,151.4
Existing Discount	\$97.6	\$27.9	\$80.0	\$154.9	\$280.1	\$418.3	\$703.7	\$657.7	\$509.7	\$485.8	\$453.2	\$167.1	\$4,036.2
Add'l Funds Needed	\$182.1	-	-	-	-	-	-	\$21.4	\$128.7	\$247.6	\$361.9	\$173.5	\$1,115.3

Figure 3: Estimated Distribution of Actual E-rate Funding Demand by Per Student Budget Range



3. FY2015 to FY2019 Library C2 Budget Utilization

There are 13,540 library sites listed on E-rate applications that have had the opportunity to apply for C2 discounts. Between FY2015 and FY2019, it is estimated that a total of \$99.18 million in E-rate discounts will be disbursed. Combined with applicants' payments of \$32.36, a total of \$131.54 million will have been invested in on-campus broadband at libraries.

Table 4: Count of Rural Library Sites and Budget Utilization by Budget Usage (FY2015-2019)

Budget Usage Range	Site Count	E-rate Discounts	Applicant Payment	Total Budget Utilization
FLOOR	3,894	\$5,970,036	\$1,364,010	\$7,334,046
\$0 to \$0.49	1,890	\$1,060,310	\$806,248	\$1,866,558
\$0.50 to \$0.99	264	\$2,324,806	\$1,812,711	\$4,137,517
\$1.00 to \$1.49	184	\$2,438,363	\$1,883,197	\$4,321,560
\$1.50 to \$1.99	151	\$2,662,990	\$2,108,433	\$4,771,423
\$2.00 to \$2.39	103	\$2,271,514	\$1,739,626	\$4,011,140
\$2.40 or more	235	\$4,703,057	\$3,699,150	\$8,402,207
Total	6,721	\$21,431,076	\$13,413,375	\$34,844,451

Table 5: Count of Urban Library Sites and Budget Utilization by Budget Usage (FY2015-2019)

Budget Usage Range	Site Count	E-rate Discounts	Applicant Payment	Total Budget Utilization
FLOOR	1,430	\$2,345,655	\$498,042	\$2,843,697
\$0 to \$0.99	3,536	\$12,006,285	\$3,427,870	\$15,434,155
\$1 to \$1.99	776	\$16,950,237	\$4,284,228	\$21,234,465
\$2 to \$2.99	434	\$17,512,010	\$3,907,543	\$21,419,553
\$3 to \$3.99	214	\$9,021,812	\$2,020,715	\$11,042,527
\$4 to \$4.99	138	\$6,849,459	\$1,672,101	\$8,521,560
\$5 or more	291	\$13,067,390	\$3,134,681	\$16,202,071
Total	6,819	\$77,752,848	\$18,945,180	\$96,698,028

BUDGET FLOORS

The following figures illustrate the distribution of site counts and E-rate discounts based on the amount of budget used at each library site, either rural or urban. For example, there were 6,430 school sites that utilized a per student budget amount ranging between \$50.00 and \$74.99 per student. For these specific sites, the total on-campus expenditure was \$235,959,766; the E-rate program provided discounts of \$156,179,381; and applicants paid a total of \$79,780,385.

Figure 4: Count of Rural Sites by Budget Utilization Range (FY2015-2019)

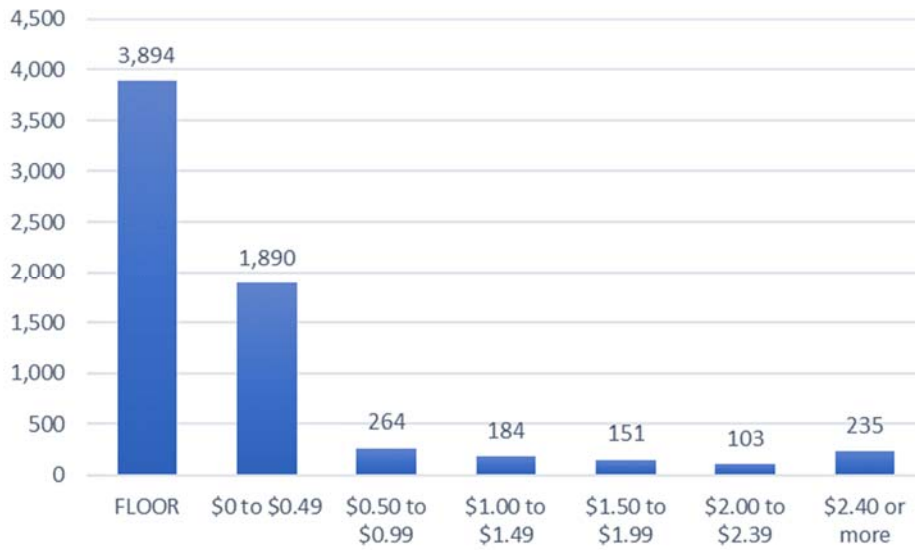


Figure 5: E-rate Discounts by Rural Library Budget Utilization Range (FY2015-2019)

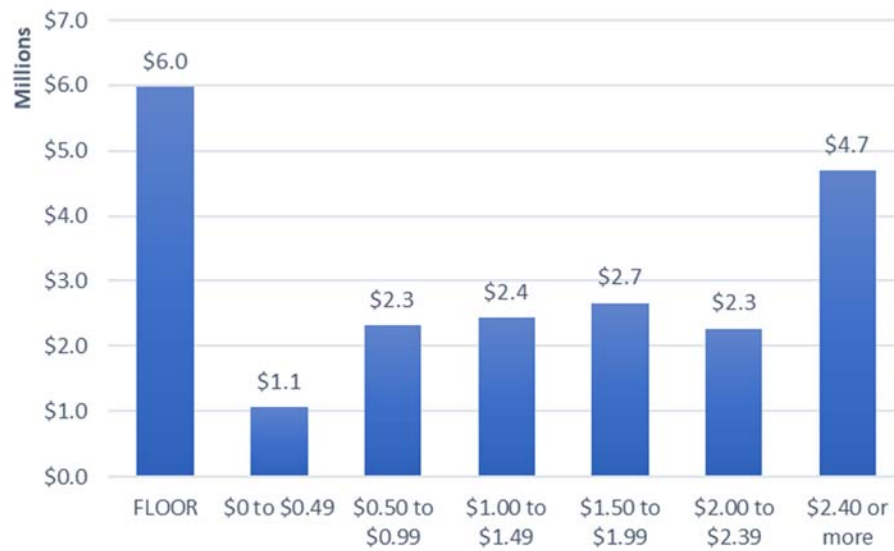


Figure 6: Count of Urban Sites by Budget Utilization Range (FY2015-2019)

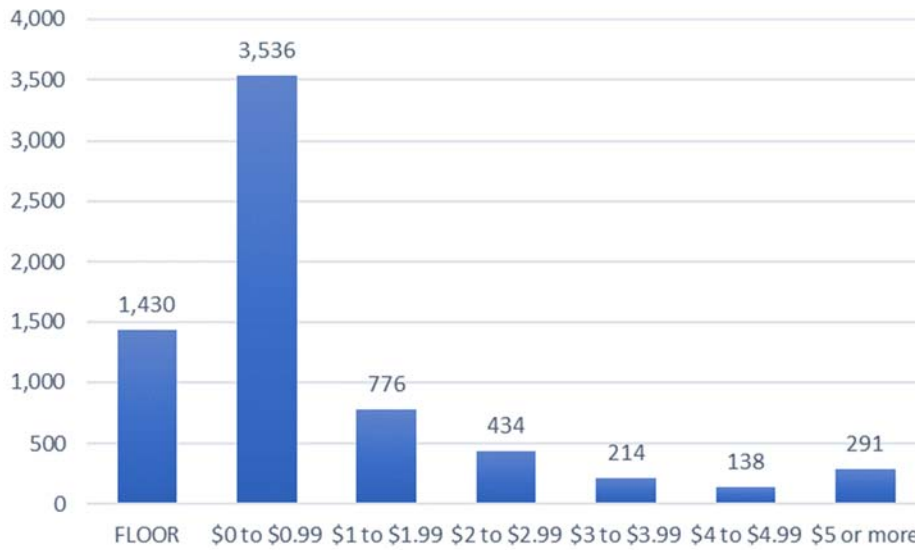
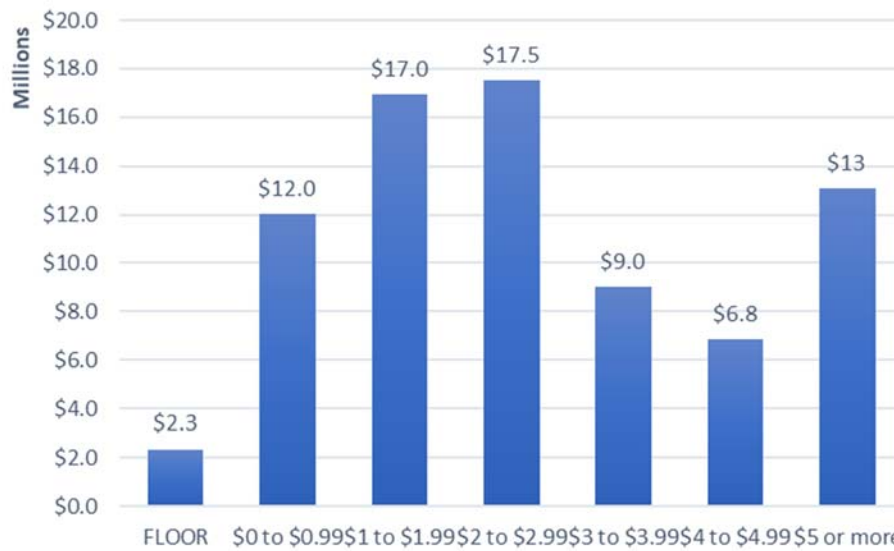


Figure 7: E-rate Discounts by Urban Library Budget Utilization Range (FY2015-2019)



BUDGET FLOORS

Library sites that qualified for the minimum budget (a.k.a. the “floor”) represented \$8.3 million in E-rate discounts from 2015 to 2019. Across the board, smaller school sites were less likely to apply for C2 discounts than larger sites (i.e. those with a total budget of \$30,000 or more.)

Table 6: Count of Library Sites Applying for C2 by Budget Floor or Another Amount (FY2015-2019)

Site Budget Amount	Total Site Count	Using C2	Not Using C2	% not using C2	Avg Budget Util of Sites Using C2 \$
Floor	5,324	1,999	3,325	62.5%	52.0%
Between floor & \$30,000	3,190	1,652	1,538	48.2%	50.3%
\$30,000 or more	5,026	2,883	2,143	42.6%	31.0%
Total	13,540	6,534	7,006	51.7%	42.3%

The lower number of C2 funding requests at smaller sites does not appear to be related to the actual technology needs of these locations. The lower application rate is most likely tied to the amount of support that is available. Therefore, we assume that an increased budget floor will translate into more of the smaller library sites submitting applications. For purposes of this analysis, the budget floor will be set at \$30,000 per site.

PER SQUARE FOOT FACTOR

Compared to school sites, there is a much smaller percentage of sites that have “maxed” their per square foot budget. The trendline for the urban library data suggests that there is a natural ceiling to the urban library budget factor that occurs around \$6 per square foot. It appears that the vast majority of urban library demand would be satisfied by using this factor. For ease of administration, it is assumed that the urban and rural budget factors could be combined into one budget factor.

ESTIMATING “REAL” LIBRARY DEMAND

The real demand from 2015 to 2019 is estimated on the following page. The demand is based on the following factors and assumptions:

- The library budget floor will be set at \$30,000. A higher percentage of sites that qualify for the budget floor will apply for C2. Instead of 62.5% of these sites not applying, it is assumed that only 42.6% of these sites will not apply. This corresponds to the percentage of sites with budgets at or above \$30,000 that currently do not apply.
- The per square foot budget factor will be set at \$6.00. It is assumed that current sites with a utilization rate of 98% or more of its C2 budget have need of additional funding. The specific amount of funding needed is assumed to be evenly distributed between the current per square foot factor and \$6.00. For example, if a urban library site had utilized all 100% of its C2 per square foot budget, an additional project cost is assumed, based on a random number between \$5.33 and \$6.00 per square foot.
- Because it uses random numbers, real demand was simulated 100 separate times. The average of these simulations is the result presented on the following page.

The result is an additional \$1.115 billion in E-rate discounts being requested over a five year period, or an annual average increase of \$223 million in E-rate discounts.

Table 7: Estimate of Actual Library Site Budget Requirements (FY2015 to FY2019)

	Estimated Actual Library Budget Requirement (2015 to 2019)												TOTAL
	FLOOR	\$0 to \$0.49	\$0.50 to \$0.99	\$1.00 to \$1.49	\$1.50 to \$1.99	\$2.00 to \$2.49	\$2.50 to \$2.99	\$3.00 to \$3.49	\$3.50 to \$3.99	\$4.00 to \$4.49	\$4.50 to \$5.00	\$5.00 or more	
Site Count	6,828	4,044	708	517	419	292	154	118	97	78	86	199	13,540
Actual Budget Req.	\$49.7	\$6.4	\$11.8	\$12.8	\$12.4	\$13.6	\$9.5	\$6.5	\$5.5	\$5.0	\$5.4	\$17.2	\$155.9
Discount Needed	\$38.2	\$5.0	\$9.2	\$10.2	\$10.0	\$11.0	\$7.8	\$5.3	\$4.5	\$3.9	\$4.2	\$13.8	\$123.0
Existing Discount	\$23.9	\$5.0	\$9.2	\$10.2	\$10.0	\$11.0	\$7.8	\$5.3	\$4.5	\$3.9	\$4.2	\$13.8	\$108.7
Add'l Funds Needed	\$14.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$14.3

Figure 8: Estimated Distribution of Actual E-rate Funding Demand by Per Square Foot Budget Range



4. Addressing the Need with System-Wide Budgets

The FCC is considering adopting a system-wide budget system. This would allow school districts and library systems to calculate a single budget that would cap the total Category Two expenditures at all their sites. Individual sites would not be subject to a specific cap, per se, other than the overall budget available to the school district or library system. This approach would eliminate a portion of the inequity that currently exists between sites. For example, a newer school building may be less expensive to upgrade (on a price per student basis.) A district-wide budget would allow the school district to shift the cost savings from the lower school building to address the technology needs of an older school building that may be more expensive to upgrade (on a price per student basis.)

Funds For Learning analyzed the FY2015 to FY2019 funding request data using the revised “actual” demand. Based on the average of 100% simulations, it is estimated that the flexibility of school districts to allocate budget amounts between school sites will address 41.1% of the site-specific budget shortfall in existing sites. For library systems, the budget flexibility will address 83.6% of the site-specific budget shortfalls.

Table 8: Five-Year Estimated Real Demand Budget Summary (FY2015-2019)

	School	Library	Total
E-rate Discount Needed	\$5,151.4	\$123.0	\$5,274.4
Applicant Portion	\$1,920.6	\$33.0	\$1,953.6
Est. Total Five-Year Budget	\$7,072.1	\$155.9	\$7,228.0

Table 9: Estimated Shortfall in Current Budget E-rate Discounts (FY2015-2019)

	School	Library	Total
Total Needed	\$5,151.4	\$123.0	\$5,274.4
Current Avail. Discounts	-\$4,036.2	-\$108.7	-\$4,144.8
Shortfall in E-rate discounts	\$1,115.3	\$14.3	\$1,129.6

Table 10: Adjusting Estimated Budget Shortfalls for System-level Budgets (FY2015-2019)

	School	Library	Total
Total Shortfall in Current Budgets	\$1,115.3	\$14.3	\$1,129.6
Est. System-level support	-\$458.6	-\$11.9	-\$470.6
Five-year Adjusted shortfall	\$656.7	\$2.3	\$659.0
Annual adjusted shortfall	\$131.3	\$0.5	\$131.8