Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Schools and Libraries Universal Service Support Mechanism	)	CC Docket No. 02-6
	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	

To: The Commission

COMMENTS OF CISCO SYSTEMS, INC.

CISCO SYSTEMS, INC.

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SUMMARY

Broadband-enabled equipment and technology is revolutionizing education, and the E-rate rules must be reformed to keep pace with this transformation. In its Visual Networking Index ("VNI"), Cisco analyzes and forecasts growth in data usage, and this year's edition shows the dramatic and growing of use of broadband by businesses and individuals. Educators, too, must benefit from these new capabilities; E-rate should help rather than hinder this process. These comments discuss a number of significant examples of this success, as well as new technologies that will enable future educational gains.

The NPRM proposes a number of beneficial reforms that would help schools use today's technology. First, the Commission should take steps to ensure more predictable funding for internal connections. Schools and libraries cannot benefit from broadband if it is not available in classrooms, and the existing priority rules have hindered many schools' and libraries' access to internal connections funding. To this end, an internal connections set-aside of at least $500 million could be a good first step. The Commission may also wish to examine whether the current distinction between Priority 1 and Priority 2 services remains useful given changes in technology. At the same time, other proposals – such as revising the discount matrix to increase schools' and libraries' funding share, or reducing or eliminating funding for basic maintenance of internal connections, would simply reduce the utility of the program. In Cisco's experience, most schools and libraries have difficulty finding the financial resources to pay the amounts currently required. And funding for basic maintenance of internal connections protects the program's investments in these services by ensuring that they continue to function over time. Another way to bring internal connections projects within the reach of more schools would be to clarify that it is permissible for schools and libraries to seek financing, including secured financing, for their undiscounted share of the cost of supported services or equipment, as long as the school or library remains ultimately responsible for the cost.

It is also extremely important that the Commission index the annual funding cap to inflation, to ensure that the fund does not lose its purchasing power over time. To maximize the benefit of broadband-enabled learning opportunities, the Commission also should provide support for video end-points. This will allow more schools and libraries to benefit from distance learning and Telepresence, benefiting students and reducing carbon footprints.

In addition, Cisco supports the Commission's proposals to fund wireless broadband services off of school property, and to fund broadband and internal connections in residential areas of schools. Students should have access broadband-based learning opportunities where they live and study. The Commission also should target E-rate support for broadband, in particular de-prioritizing dial-up Internet access. Cisco also supports the fair and efficient mechanism for disposal of funded equipment proposed in the NPRM.

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Cisco Systems, Inc. ("Cisco") submits these comments in response to the Commission's Notice of Proposed Rulemaking[1] on implementation of various National Broadband Plan[2] recommendations for reform of the E-rate component of the Commission's universal service program.[3] As discussed in more detail below, Cisco supports the Commission's effort to modernize the E-rate program for the Internet age, including the proposals to ensure more predictable funding for internal connections, protecting the capped fund's purchasing power. Cisco also urges the Commission to provide E-rate support for video end points so that schools can benefit from today's Telepresence technology for distance learning opportunities.

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[1] *Schools and Libraries Universal Service Support Mechanism, A National Broadband Plan for Our Future*, CC Docket No. 02-6, GN Docket No. 09-51, Notice of Proposed Rulemaking, FCC 10-83 (rel. May 20, 2010) ("NPRM").

[2] Federal Communications Commission, *Connecting America: The National Broadband Plan* (rel Mar. 16, 2010) ("National Broadband Plan" or "NBP").

[3] The Commission's E-rate rules are generally codified in 47 C.F.R. §§ 54.500 *et seq.*

I. INTRODUCTION: THE BENEFITS OF BROADBAND FOR EDUCATION

Cisco strongly agrees with the Commission's intention to improve and modernize the E-rate program to maximize educators' and students' access to the enormous benefits of broadband.

A. Broadband Internet Access Has Enormous Potential to Improve Education

The benefits of broadband are driving businesses and consumers to become much heavier users of broadband, and education, too, will benefit if students and educators can take advantage of the power of broadband access to the Internet. The growth in demand for broadband and the capabilities that it delivers is revealed dramatically in Cisco's Visual Networking Index (VNI), the company's ongoing effort to forecast and analyze the growth and use of IP networks worldwide.[4] Global IP traffic will increase by a factor of four from 2009 to 2014, approaching 64 exabytes (i.e., 64 billion gigabytes) per month in 2014, compared to approximately 15 exabytes per month in 2009. By 2014, annual global IP traffic will reach almost three-fourths of a zettabyte (767 exabytes, or 767 billion gigabytes).[5] By 2014, the various forms of video carried in IP format (TV, VoD, Internet Video, and P2P) will exceed 91 percent of global consumer traffic. By 2014, global online video will approach 57 percent of consumer Internet traffic (up from 40 percent in 2010). Globally, mobile data traffic will double every year through 2014, increasing 39 times between 2009 and 2014. These stunning increases in usage will occur

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[4] The VNI is available at: http://www.cisco.com/en/US/netsol/ns827/networking_solutions_sub_solution.html.

[5] One exabyte equals one billion gigabytes; one zettabyte equals one trillion gigabytes.

for a reason – they reflect businesses' and consumers' growing recognition of broadband Internet access's power to improve the way people work, live, play, and learn.

Broadband-based applications improve learning and help schools to face today's challenges better. Virtual classrooms expand learning opportunities by bringing teaching resources to students who otherwise would lack them. Online learning tools provide opportunities for interdisciplinary and project-based work, and foster a collaborative learning process. Online applications also permit real-time assessment and feedback, making teaching more effective. Broadband in the classroom also permits the teaching of digital literacy, which provides job and life skills for today and tomorrow.

One dramatic example of how broadband access can improve education is Cisco's new Cius offering, which combines a powerful, mobile broadband-connected tablet computer with two high-definition cameras capable of capturing video or still images with collaborative technologies like WebEx and Show and Share to allow teachers, students, and parents to interact with each other in new and more effective ways. Cius's light weight and convenient form factor allow teachers to, for example, download electronic lessons and texts to their classrooms instantly, conduct video conferences, stream HD content, create and edit documents, browse the web, and use instant messaging and email applications. Cius also enables users to take advantage of VoIP applications. Cius has been designed to run on an enterprise network, using a "thin client" design where applications and data are provided from the enterprise cloud. The Cius tablet runs the open-platform Android operating system and has access to a large and growing library of educational applications, and can connect to the Internet via fixed or mobile broadband connections, including Wi-Fi. A video demonstration of Cius's enormous potential to

improve the educational process is available online.[6] If viewed as a component part of a powerful new cloud-based approach to computing and communications, Cius can become an important new educational tool, but if labeled as an alternative to a PC, Cius will not be available to E-rate institutions. Thus, Cius demonstrates that the Commission needs to consider how dynamic innovation in IP-based technologies is rapidly blurring E-rate legal distinctions created nearly a decade and a half ago.

B. Broadband's Power to Improve Education Has Already Been Demonstrated

The power of broadband to improve education is already well established, with many success stories. For example:

In 2005, the Enlarged City School District of Middletown, New York, was on the state's "watch list" and identified by the No Child Left Behind ("NCLB") process as "needing improvement" in 23 areas. It faced significant challenges with 72 percent of its students classified as "high need" and 20 percent speaking English as a second language. A new superintendent overhauled the district's use of educational technology, replacing outdated equipment with a unified communications platform supporting voice, data, and video applications. Within five years, the district turned itself around, and all but two schools are now in "good standing" under NCLB, with only two areas "needing improvement." In addition to improving learning opportunities, the technology upgrade improved public safety in school buildings.

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[6] A demonstration of Cius's educational capabilities is available here: http://www.youtube.com/watch?v=9pGTyj7DohU.

Similarly, the Park Hill School District, near Kansas City, increased the capacity of its network such that it is now possible for faculty, students, parents, and administrators to access learning resources at any hour of the day, any day of the week. It enabled the school to create a "Virtual Academy" offering students numerous courses entirely online. This allowed students to work at their own pace and also facilitated a flexible schedule for high school students that needed to work after school.

C. Targeted E-Rate Reform Can Produce More Success Stories

These success stories should not be isolated instances. To this end, Cisco urges the Commission to implement reform consistent with these comments. Although Cisco's comments below follow the organization of the NPRM,[7] Cisco particularly urges the Commission to:

- Ensure more predictable funding for internal connections, including by setting aside a fixed amount, at least $500 million per year, for internal connections;
- Index the annual funding cap to inflation to protect its purchasing power over time;
- Provide support for video end-points to permit more schools to benefit from distance learning opportunities and Telepresence.

II. SCHOOLS AND LIBRARIES SHOULD HAVE GREATER FLEXIBILITY TO SELECT BROADBAND SERVICES

A. Support Should Be Available for Wireless Services Outside of School

As the NBP correctly observes, "E-rate should support online learning by providing wireless connectivity to portable learning devices so students can engage in learning while not at

[7] *See* NPRM at ¶ 103 ("We also strongly encourage parties to track the organization set forth in the NPRM in order to facilitate our internal review process.").

school."[8] The Commission should adopt this recommendation and make it effective as soon as possible.

As the NPRM points out, technological advances create educational opportunities for students anywhere students have access to a broadband connection, allowing learning to continue even after students leave school grounds.[9] Some students may have broadband at home, but others do not, and even some students with broadband at home may, for logistical or other reasons, study at some other location or be unable to use their home broadband connection because it is being used by a sibling or parent. By allowing E-rate support to fund wireless broadband even if it is used off of school property, the Commission can ensure that more students have access to the rich learning opportunities that broadband Internet access provides, for more of the time.

Under the existing rule, E-rate would support the entire cost of a wireless broadband subscription as long as the computer to which it is connected never leaves school property, but would require cost-allocation if the computer's broadband connection were sometimes used off of school premises. This distinction undermines educators' ability to capitalize on broadband-based technology, and it should be eliminated.

E-rate support for wireless broadband should be provided on a technology-neutral basis, and should support wireless broadband using both licensed and unlicensed spectrum. Each type of wireless broadband has its own specific advantages and may be more or less appropriate in a given situation. The program rules should not impose any artificial restrictions on a school's ability to select the wireless broadband solution that best meets its needs.

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[8] NBP at 239, Rec. 11.23. *See also* NPRM at ¶ 45 (proposing to adopt this recommendation).
[9] NPRM at ¶ 46.

B. Access Should Be Expanded for Residential Schools That Serve Unique Populations

Cisco generally agrees that schools with residential facilities on their property should be able to receive E-rate funding for priority one and priority two services in those residential areas.[10] Students that live on school campuses should be able to benefit from modern educational technology on the same basis as students who live at home.

There is no obvious reason, however, why eligibility for such funding should be limited to "circumstances where the students would not have access to comparable schooling or training if they resided at home" because of "medical needs, cognitive or behavioral disabilities," or when there is a practical necessity that the student board at school "due to challenging terrain or their home's distance from a school."[11] First, such a requirement would be very difficult for USAC to administer. While it may be obvious whether a school serves students with medical needs or disabilities, it will be much more difficult to identify schools that serve students that must board because of geography or terrain. In practice, many secondary schools with residential facilities serve some students whose families live relatively nearby and others that live far away, and individual families make decisions about whether to board their children based on myriad factors. Thus, at most schools with residential programs, some students will meet the criteria while others will not, raising difficult questions of allocation and eligibility.

Moreover, the NPRM elsewhere notes that even some students who live at home do not have broadband access there, and seeks to remedy this deficiency through other E-rate reforms.[12] If the goal of the current reform effort is to ensure that students have the ability to access online

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[10] NPRM at ¶ 57.
[11] *Id.*
[12] *Id.* at ¶ 45.

learning opportunities outside of formal school hours, there is simply no reason artificially to restrict the availability for funding for services and facilities in residential areas on any school grounds.

C. E-Rate Support Should Be Targeted for Broadband

As discussed in detail in Section I of these comments, broadband gives educators access to a world of new technologies and teaching methods that show enormous promise for improving the learning process.[13] Unfortunately, as the NPRM correctly notes, few schools have the financial resources, in today's economic climate, to upgrade to higher-bandwidth services.[14] Cisco therefore supports the proposal to reallocate finite E-rate funding to place a greater priority on the provision of the broadband services that enable these new educational opportunities. In particular, the Commission should give broadband Internet access services priority over dial-up access. There is no reason today that requests to fund broadband access (or, for that matter, internal connections) should have to compete with requests for dial-up Internet access. In addition, prioritization of broadband applications would create incentives for schools to obtain broadband access, further unleashing the educational opportunities that broadband presents.

III. THE COMMISSION SHOULD EXPAND THE REACH OF BROADBAND TO THE CLASSROOM

A. More Predictable Internal Connections Funding is Needed

1. A Set-Aside Would Help, While Increasing Schools' Financial Burdens Would Be Counterproductive

The National Broadband Plan and the NPRM provide ample evidence that the current E-rate rules result in the denial of too many schools' and libraries' requests for internal connections

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[13] *See supra* Section I.
[14] NPRM at ¶ 58.

support.[15] The lack of internal connections, in turn, prevents students and teachers from having access to the significant new educational opportunities that broadband enables.[16] Cisco therefore supports the proposal to modify the rules to make such funding available to more applicants.

To this end, Cisco supports setting aside a defined amount of funding within the E-rate cap and dedicating that amount to internal connections support.[17] This will ensure that funding for telecommunications services and Internet access does not exhaust the cap, leaving no remaining funding for internal connections. In determining the amount of the set-aside, the proposed $500 million figure appears appropriate and reasonable,[18] although the Commission's own data show that this amount may not be adequate. For example, internal connections funding requests in 2007 topped $2 billion.[19] At the same time, there is clearly substantial demand for telecommunications services and Internet access,[20] requiring the Commission to strike a balance. The $500 million proposal appears to be a good place to start, and that figure could be fine-tuned based on experience in future years.

While more support should be made available for internal connections, the Commission should avoid counter-productive proposals. Specifically, the Commission should not revise the discount matrix to reduce the discount percentages available to eligible schools and libraries.[21] While increasing the amount that each school must pay will leave more funding available to

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[15] NBP at 237, Rec. 11.16; NPRM at ¶¶ 62-64.
[16] *See supra* Section I.
[17] NPRM at ¶ 74.
[18] *Id.*
[19] *Id.* at ¶ 63.
[20] *See, e.g., id.* (indicating that 2010 priority one funding requests were approximately $2 billion).
[21] *Id.* at ¶ 76.

other applicants, it will ultimately undermine the utility of the program. In Cisco's experience, most schools are barely able to budget for the amounts of funding that they are required to put forward under the current discount matrix. Increasing schools' financial burdens will only move internal connections out of reach of more schools.

2. Basic Maintenance for Internal Connections Must Be Supported

Similarly, eliminating or capping support for basic maintenance for internal connections[22] will undercut the program's goals. In modern computer networks, internal connections are complex systems consisting of both hardware and software. In Cisco's experience, schools do not have the financial or technical resources to maintain their internal connections, and in particular software. If basic maintenance is not supported, internal connections will not receive the same basic software maintenance that enables enterprise networks, and even home networks, to function properly. Software, consisting of millions of lines of code, is improved over time, as bugs and defects are detected in operating systems. Basic maintenance agreements ensure that these software modifications are properly provided to, and installed by, school networks. As a result, it may not be feasible to "spread funding more broadly across needy schools and libraries for internal connections"[23] without undermining the utility of most, if not all, existing internal connections. In short, it would benefit no one to fund internal connections for a large number of schools under a framework that deprives them of the resources to maintain those connections.

To protect the E-rate program's investments in internal connections, the Commission also should clarify that support for basic maintenance of internal connections can be used to fund

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[22] *Id.* at ¶¶ 80-83.
[23] *Id.* at ¶ 81.

standard updates for networking software. As the Eligible Services List acknowledges, software is an element of an internal connections system;[24] computer networks require software as well as hardware to function. Like all software, networking systems must be updated periodically. To eliminate any doubt, the Commission should clarify that standard upgrades for networking software are properly deemed basic maintenance for internal connections eligible for support.[25]

3. Allowing Schools and Libraries to Finance a Portion of Their Share of the Cost of Supported Services Would Expand the Reach of the Program

At present, E-rate rules require the participating school or library to pay the non-discount portion of supported services.[26] This rule is intended to ensure that the participating institutions have assigned Internet connectivity some priority as a budget matter, and will provide the necessary focus on ensuring that the project will be completed and supervised to the benefit of students or library patrons.[27] On its website, USAC emphasizes that "Applicants are required to pay the non-discount portion of the cost of the goods and services to their service provider(s)" and "Service Providers are required to bill applicants for the non-discount portion" of the services they order.[28]

Since the budgets of local governments have come under intense pressure in the recent economic downturn, however, Cisco has encountered otherwise eligible institutions that cannot

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[24] 2010 Eligible Services List at 14 (providing internal connections support for computer operating system software).

[25] *See id.* at 20-21 (setting out eligible services for basic maintenance of internal connections without mention of software).

[26] 47 C.F.R. § 54.523.

[27] *Federal-State Joint Board on Universal Service,* CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, 9036 ¶ 493 (1997) (subsequent history omitted).

[28] Universal Service Administrative Company, "Obligation to Pay Non-Discounted Portion," http://www.usac.org/sl/applicants/step11/obligation-to-pay.aspx.

come up with the matching amount in advance. As a result, these institutions are electing not to participate in the E-rate program. This is happening across the board and without regard to other financial indicia such as participation in the school lunch program.

As a result, the Commission should clarify that its rules interpose no barrier to institutions' financing all or part of their undiscounted portion of the cost of supported services. This clarification would allow more institutions to benefit from the E-rate program, while fulfilling the public policy goal of ensuring that the institution is prioritizing its participation in the program. The rule is intended to ensure that service providers do not provide "free" services or financing to undermine the educational institution's financial interest in the supported services.[29] With properly structured financing, however, the school or library would remain responsible for its undiscounted portion, but could stretch the payment over two or three years. This would be particularly useful to schools and libraries seeking to undertake internal connections projects, which typically have significant up-front costs.

To allow schools and libraries to use financing to make more internal connections projects feasible, Cisco recommends the following changes to program rules and USAC policies. First, the Commission should clarify that schools and libraries may fund the undiscounted portion of Priority 2 projects with financing, including secured financing, as long as the school remains the responsible party for the undiscounted portion of the cost of the supported services under any financing arrangement. Second, the Commission should recognize that some financing arrangements may require USAC to make changes to the way it conducts audits and

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[29] *See, e.g., Schools and Libraries Universal Service Support Mechanism,* CC Docket No. 02-6, Third Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 26912, 26929 ¶ 41 (2003).

post-commitment reviews. Specifically, the Commission should recognize that, where the school remains ultimately responsible for the undiscounted portion of the cost of services or equipment under a finance agreement, it may be perfectly legitimate for the lender to pay the service provider, as long as the school or library pays the lender pursuant to the financing agreement. This could be accomplished most simply by directing USAC to modify its invoice control procedures to allow for this flow of payments. Alternatively, the Commission could designate payments to lenders as "eligible services" as long as they are for the purchase of otherwise eligible services.

4. The Line Between the Priority Categories Should Be Re-Drawn for the Internet Age

Rather than thinking in terms of a set-aside within the overall fund for Priority 2 services, the Commission may wish to consider whether the distinction between telecommunications and Internet access services, on the one hand (Priority 1), and internal connections, on the other (Priority 2), remains a useful distinction given the way services are provided today.[30] In fact, there are contexts already in which the Priority 1/Priority 2 distinction prevents the efficient provision of equipment and services to schools and libraries. These instances are bound to proliferate as broadband technology increases the range of services that can be provided with the same piece of equipment.

Perhaps the best current example of this problem is the convoluted way that equipment manufacturers and service providers are required to configure equipment when providing managed VoIP offerings to schools and libraries that receive E-rate funding. With current

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[30] In fact, a set-aside for Priority 2 services and equipment is already a partial realignment of the priority categories, as the Priority 2 services and equipment within the set-aside will effectively have priority over the "Priority 1" services that they may displace.

equipment, the same router can readily be used to route VoIP traffic to VoIP handsets *and* data traffic within a local area network (LAN). Under current program rules, however, LAN equipment is Priority 2, while VoIP service is Priority 1. Moreover, because VoIP receives Priority 1 treatment only if it is a "service," the school may not own or lease the router used to direct voice traffic within the school or library. USAC has published detailed information diagramming the technically artificial and unnecessary configurations that must be implemented in order to comply with existing program rules.[31]

The current rules thus preclude schools from obtaining managed VoIP and data offerings that most businesses routinely procure today. This framework forces American educators to fight with one hand tied behind their figurative backs, and should therefore be abandoned.

As a result, re-thinking the distinction between Priority 1 and Priority 2 services may be a way for the Commission to increase the efficiency of E-rate investments while also achieving its goal of providing more predictable internal connections funding. In any event, however, the rules should be clarified so that the problems with providing managed VoIP offerings, and others like it, are eliminated.

B. The Annual Funding Cap Should Be Indexed to Inflation

Cisco agrees that the E-rate program should retain its purchasing power over time, and therefore supports the proposal to index the annual funding cap to inflation.[32] Over time,

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[31] *See* "Determine Your Eligible Services: Interconnected Voice-over-Internet Protocol (VoIP)," http://www.usac.org/sl/applicants/step06/voice-over-internet-protocol.aspx (demonstrating with diagrams the standard configurations that do not comply and the artificial configurations that do comply).

[32] NPRM at ¶ 84.

technology is making broadband connectivity even more crucial to the learning experience.[33] Because the utility of the program is *increasing* with time, the Commission should not allow inflation to erode the fund's ability to support advanced learning technology.

C. Video End-Points Should be Added to the Internal Connections Eligible Services List

One of broadband's key benefits for educators is that it offers the ability to deliver lectures, discussions, and other instructional material remotely, via high-speed, interactive video connections.[34] Under the current rules, telecommunications or broadband connections used for video distance learning and educational Telepresence are supported, as is certain video equipment.[35] This approach, however, leaves substantial questions regarding the eligibility of current video end points, including the terminals used by videoconferencing services. Yet video will be a widely used application in schools. Students will use it to talk to experts globally, collaborate with other students locally and around the world, create video content, and use video to participate in real-world activities as varied as civic and world affairs, journalism, science, and language education to name a few. The rich media experience of video – whether standard definition, high definition or 3D – offers unparalleled educational experiences to engage students and teach critical thought in ways never before possible. The end points used with today's Telepresence solutions allow cutting-edge distance learning and educational collaboration. They are being adopted widely by global businesses as an economical and ecologically friendly alternative to in-person meetings, and educators should be empowered to benefit from them as

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[33] *See supra* Section I.
[34] *See generally supra* Section I.
[35] *See* 2010 Eligible Services List at 3, 4, 12, 16.

well. Just as the program supports VoIP telephony equipment,[36] it should support qualifying schools' and libraries' access to video end points.

IV. THERE SHOULD BE A PROCESS FOR DISPOSAL OF OBSOLETE EQUIPMENT

Cisco agrees that the reform effort should include clarification of schools' and libraries' ability to dispose of obsolete supported equipment.[37] Specifically, Cisco agrees with the proposal to allow schools and libraries to dispose of E-rate equipment for payment or other consideration subject to the five conditions proposed by E-Rate Central.[38] This proposal will adequately protect against waste, fraud, and abuse while still providing an orderly process for schools and libraries to dispose of equipment that has reached the end of its useful life.

CONCLUSION

Cisco commends the Commission for undertaking this proceeding to update the E-rate program for the broadband age, and urges the Commission to adopt reform consistent with these comments.

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[36] *Id*. at 15.
[37] NPRM at ¶ 89.
[38] *Id.* at ¶ 90.