Before the
Federal Communications Commission
Washington, D.C. 20554

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

COMMENTS OF THE ILLINOIS DEPARTMENT OF CENTRAL MANAGEMENT SERVICES, A STATE AGENCY OF ILLINOIS, REGARDING THE PUBLIC NOTICE SEEKING FOCUSED COMMENT ON E-RATE MODERNIZATION

Date: April 7th 2014

Illinois Department of Central Management Services (CMS), a state agency of Illinois submits the following comments in response to the FCC's Public Notice seeking focused comment on E-rate modernization for Schools and Libraries.

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1 Introduction

The Illinois Department of Central Management Services (CMS), a state agency of Illinois, welcomes the opportunity to respond to the Public Notice from the Federal Communications Commission (FCC) seeking focused comment on E-rate modernization.

This response reflects the views of CMS. CMS manages the Illinois Century Network (ICN), the state network in Illinois providing high speed broadband to over 6000 education locations, libraries, state agencies and other community anchor institutions.

The response is organized as follows. Section 3 - Principles provide the high level principles that govern our detailed response. Section 4 provides the detailed response to select paragraphs in the Public Notice.

Appendix A contains a brief introduction to Illinois Century Network, the state education network in Illinois that plays a key role in providing high speed broadband to K-12 schools and libraries in Illinois, as well as serving other Illinois community anchor institutions and commercial service providers. Appendix A also contains a brief introduction to ICN Regional Technology Centers.

2 Contact Information

To discuss any aspect of this response in further detail, please contact

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3 Principles

This section describes the principles that we believe are important and will govern our response. We provide this separate section to be clear on the principles we strongly recommend the FCC follow, while we have flexibility on aspects of detailed implementation. In formulating our response, we have received input from Illinois School Technology Directors, Service Providers and other stake holders, however, CMS is solely responsible for this response.

We believe the following of these principles will result in increased broadband competition resulting in lower costs to schools and libraries and the E-rate program. Please note the following definitions as used in the response: (i) Internal Connections refers to the broadband infrastructure within a school, from the school property line to the device (ii) External connections refers to broadband infrastructure external to the school, i.e. outside the school property line, from the school property line to the public internet or from the school property line to the property line of one or more other schools.

Please note that any reference to 'school' or 'library' in this response should be taken to mean 'school and library'.

3.1 *Internal Connections within Schools and Libraries*

We believe that it is preferable for schools and libraries to receive a set amount of funding per year for internal connection costs rather than funding once every five years or funding periodically when all of the applicants have been funded. We believe it is of benefit to schools and libraries to provide certainty regarding the level of funding to expect per year. This will facilitate planning of internal connections. We also believe it is preferable for all schools to receive some internal connection funding rather than just those schools with the highest discount level repeatedly receiving funding.

Having some certainty regarding internal connection funding to be received each year may allow financing arrangements to be established between the school and vendor, where by the vendor provides equipment up front.

We do believe there is a requirement for an initial infusion of one-time funds to jumpstart internal connection architecture in some Illinois schools and libraries that have no or minimal internal connections implemented.

We agree with the formula proposed in the attachment of the public notice and agree that the discount level of the school should factor into the formula.

We believe use can be made of an internal connection reference architecture document that provides a framework or architecture for internal connections within schools. This document will allow flexibility for the implementation but the implementation must follow the rules and guidelines as specified. We will work with other states and other public and private organizations together with IT directors in the production of the internal connection reference architecture. The reference architecture document will be updated periodically to reflect technology advances in the market place.

Although each school is unique we believe a common architecture can be implemented to all schools within Illinois and indeed to all schools within the US. An experiment we have proposed will validate the

use of an internal connection reference architecture for schools and how ICN Regional Technology Teams can be leveraged to assist schools in implementing the reference architecture.

We do believe with internal connections that effective use can be made of bulk purchasing and state master contracts.

In terms of the equipment or services eligible for purchase we believe the focus should be on equipment and facilities to bring high-speed broadband from the school property line to the device. Any piece of equipment that facilitates this we believe should be eligible for internal connection funding.

We believe that applications or services that utilize the high-speed broadband while important for schools, we believe should not be funded by E-rate funds, with the exception of the VoIP application for a limited time period. We believe maximum leverage can be obtained with the utilization of the E-rate funds for high-speed broadband infrastructure. High speed broadband from the public Internet to the device and high-speed broadband between schools provides the best use of funds and maximum leverage for the utilization of new and innovative applications and services for schools and libraries. We believe this use of funds will enable maximum benefit to students and library patrons, advancing their learning and skill set for living and working in the 21st century. For the VoIP application, we believe this should be an eligible service for a defined time period, as schools and libraries transition to VoIP.

We believe that internal connections should not be treated with lesser priority than external connections. We believe internal connections simply provide the broadband infrastructure supporting the last several feet or hundreds of feet to bring broadband to the device. This infrastructure just happens to be within the school property line and typically managed and owned by the school. We do agree that the architecture of internal connections typically differs from external connections, however, this does not impact the priority.

3.2 External Connections to Schools and Libraries

If E-rate funds the build of high speed broadband connections to schools and libraries, via any subsidy amount, then we believe schools and libraries should have the option of having a truly open access network built. By true open access this means (1) retail service providers compete to offer high speed broadband via lit service to the school or library utilizing the built infrastructure and (2) any retail service provider can interconnect to the built infrastructure that serves the school or library.

In the above open access scenario the service provider that wins the initial contract will be responsible for the build and will be responsible to provide lit service to the school or library for the first contract period (which will have a maximum of five years). From the built infrastructure, the school or a representative of the school (eg. the State research and education network or an agency of the State) will own at least 4

strands of the built fiber infrastructure. 4 strands will allow the school or library to be in a redundant architecture.

For the second contract period, the school will rebid the lit service, allowing any service provider (including the initial service provider awarded the first contract) to interconnect to the fiber to offer lit service. This process of rebidding the lit service to the school at least every 5 years we believe promotes competition and ultimately results in reduced monthly charges incurred by the school and E-rate for lit service.

We believe there is a real issue in the marketplace today that schools and libraries and E-rate are paying monthly charges that are too high due to lack of competition and the monopoly position of the provider that has built broadband infrastructure to the school and library. And this monthly charge is being subsidized by E-rate funds.

The service provider that implemented or constructed the original fiber connection will be responsible for the maintenance of that fiber. During the initial contract period the maintenance charge to the school is rolled into the monthly lit service charge. For the second and subsequent terms, the service provider that wins the lit service contract will be responsible for the maintenance charge. The maintenance charge will be agreed upfront, and will be subject to agreed annual increases, eg. based on Consumer Price Index (CPI).

We believe there is enough incentive for service providers to respond to E-rate RFP's and build infrastructure for the school and library and we believe this supports the primary purpose for the E-rate funds, which is to assist schools and libraries with high-speed broadband. We believe this approach will ensure a competitive marketplace and provide opportunity ensuring prices as low as possible for schools.

We would thus like schools to be given the option of owning their own fiber or allowing ICN or State agency's to own the fiber (on their behalf). Thus schools that believe they have the capability, the expertise and the knowledge to own their own fiber should be allowed to do so. Or if the school wants the State research and education network to own the fiber then this should be allowed. These options will be in addition to the current options available to schools, for example, where the service provider offers a managed lit service to the school and owns all fiber constructed.

Letting the school decide how they want their money and E-rate funds spent we believe provides the best solution. Putting artificial restrictions on how schools can spend their own money and E-rate funds we believe reduces the effectiveness of the spend of those funds.

There are schools particularly in remote rural areas that cannot afford the E-rate required match due to the significant construction required. These schools are typically still connected via low-speed connections,

for example T-1, and are in need of additional support. Thus we believe an infusion of one time capital funds for external connections to these schools is needed.

We believe the state can provide assistance in selecting the schools that are eligible for additional support for high-speed broadband. We believe the States research and education networks can play a key role in bringing high speed broadband to schools and libraries. For example providing last mile connectivity to remote rural schools and libraries ensures high speed broadband for decades into the future. A State research and education network has a unique position of being owned by the public and providing service to schools and libraries. We believe the State research and education network should have unique consideration for E-rate funds.

3.3 Reduced Support for Voice Services

We believe a gradual phasing out of voice services is an acceptable approach to eliminating voice from the eligible services list. The proposal suggested in the public notice of gradually reducing the discount rate by a certain percentage each year we believe is acceptable. This will allow schools and libraries to prepare for the lack of support for voice service over a multiyear period.

We believe a gradual phasing out of voice service over 3 to 5 years makes sense, with at least five years being the phase out period especially for poor school districts in rural remotes areas. Some schools today are in the midst of contract periods where there are several years left on the contract to provide voice service.

We believe that as schools upgrade to high-speed broadband, voice service can be provided as an application over the high-speed broadband. Thus we believe greater benefit results and maximum leverage results if E-rate funds are spent on the underlying broadband infrastructure for both external connections and internal connections rather than being spent on the applications that run over this infrastructure. That's not to say that these applications are not important for schools but that we believe the most productive use of E-rate funds for all of Illinois is to ensure that all schools and libraries have access to high speed broadband.

We are flexible on the mechanism of phase out but the approach of gradually reducing the discount rate seems reasonable.

3.4 Demonstration Projects and Experiments

We would like to propose two experiments, one addressing internal connections and one addressing external connections. The experiments implement some of the principles discussed in section 3 and will

provide valuable data and experience for both the FCC and Illinois. Further detail on the experiments is given in section 4.

4 Detailed Responses to the Questions

This section provides responses to selected questions asked in the public notice.

10. We agree with providing a set amount of funding, rather than classifying internal connections as priority 2. Internal connections essentially represent the infrastructure for the last portion of the broadband connection from the school property line to the device. We believe this internal connection is not lower priority than the external connection from the public internet to the school property line. Thus having a set amount of funding for internal connections we believe provides the optimal approach. We also believe an initial one time injection of funds is required to jump start internal connections in the most challenged schools today.

11,12. We agree that only equipment and supporting software that is essential to getting high-capacity broadband from the school property line to the device should be eligible for internal connection support. We believe well-established optimizing devices that include but are not limited to devices enabling caching and firewalling should be included in the list of eligible equipment.

13 – 23. We believe the annual allocation for internal connections as described in paragraphs 20 - 22 represents the best approach for funding internal connections. Ensuring that all applicants receive some internal connection support and having certainty what support is provided each year will allow schools and libraries to better plan their internal connection upgrades year on year. Schools and libraries will make their own decisions as to where to upgrade their internal connections. Having a degree of certainty over the expected internal connection funding to be received each year will allow vendors and schools to enter into multiyear contracts with equipment provided by the vendor upfront. We believe this approach is particularly suited when there has been a one-time infusion of funds to upgrade the schools internal connection architecture, since following the upgrade schools can then plan on where to direct internal connection funds in subsequent years and prioritize what needs upgrading in their buildings.

26. We strongly believe that the commission should undertake a one-time infusion of capital funds to construct broadband infrastructure to schools and libraries most in need, for example those in remote rural areas. There are a significant number of schools in Illinois that lack access to high speed broadband. They are currently connected via T-1 lines principally because the cost of upgrade even with current E-rate support far exceeds their financial means. The schools are typically miles away from a suitable interconnect point to high-speed broadband. CMS would target schools in remote rural areas prioritizing

those schools with the highest student populations. In Illinois we are issuing an RFI requesting input on available fiber, the received information will be used to plan fiber builds to these prioritized schools understanding where fiber is already available. We believe it is important that the state is involved in prioritizing and selecting the schools eligible for onetime capital funds.

The onetime infusion of funds should result in true open access fiber, owned either by the school or the state. This fiber infrastructure will be available to retail providers on a competitive basis and will be rebid at the conclusion of each contract term. We believe this approach will dramatically reduce broadband pricing to schools and libraries and with the characteristic of fiber whereby fiber cable is purchased in bundles of strands additional strands installed can be made available for the surrounding community and managed and owned by the initial service provider. This provides an additional incentive for a service provider to respond to the RFP from the school. (Additional incentive over and above the profit from just providing lit service to the school.)

For new construction fiber should be the technology deployed and in certain scenarios where the school is rural and remote wireless connections may be considered.

27. We believe to address this question the fiber needs to be truly open access meaning that any party can provide lit service over the dark fiber for a contract term or that any party can interconnect to the fiber at a fiber interconnect point.

28. We would support increasing the discount rate for the onetime capital funds by fixed percentage, this would certainly help remote rural locations and those schools that cannot afford the match. 10% or 15% would be an appropriate percentage increase.

29. Our preference would be that one time capital funds are made available upfront to fund the construction cost of fiber. Funding could also be made available over a multiyear period to fund the construction cost. 5 years would be a reasonable time period.

30. We believe that a combination of broadband speed targets and knowledge of the current broadband technology to the school should be used to identify those schools eligible for onetime capital funding. Broadband technology type is required to understand if the school can scale in broadband speed or if the technology provides an inherent limit to the broadband speed. For example there is an inherent limit with a T1 connection of 1.5 Mb/s whereas with fiber while the school may be subscribing to e.g. 5 Mb/s today the school should be able to order a higher broadband speed from the service provider.

31 – 32. We believe a combination of economic need and efficiency metrics provides a good approach to prioritizing funding and ensures assistance is directed to those in need while being efficient with the funds. For example schools and libraries in a discount band of for example 80% to 90% could all be

treated equally with respect to economic need and could now be prioritized based on efficiency metrics. A suitable efficiency metric would be the total number of students currently in buildings without infrastructure capable of meeting commission adopted speed goals with the scoring as suggested in paragraph 32 being based on the total cost per student served.

We do not believe the commission should prioritize upgrades that do not increase the speed available to applicants but reducing recurring costs for new investment. We believe that schools themselves can initiate an upgrade that reduces their recurring costs over time. Thus we believe that schools and libraries do not need funding support in this scenario.

33. Yes we believe the limit for special construction charges should be relaxed especially if onetime capital funds are made available for construction. For example we propose a limit of $2 million to address remote rural areas of Illinois.

40 – 54. We believe a gradual phasing out of voice service is a sensible approach and the approach suggested in paragraph 41 is a reasonable method to phase out voice service. We would also recommend that those schools most in need, at the highest discount level, have at least a five year phase out period with an ever decreasing discount level.

We believe that applications that utilize the broadband infrastructure should not be eligible services for this program, with the exception of the VoIP application for a limited time period. This does not mean to say applications are not important for schools and libraries, they indeed are, and indeed are necessary for schools and libraries, but applications we believe do not provide the maximum leverage of the funds spent. We believe maximum leverage in terms of education and serving library patrons will result when E-rate funds are spent on the foundational infrastructure of broadband to and within schools and libraries.

We thus believe that applications should not be on the eligible services list with the exception of the VoIP application for a limited time period. As schools and libraries transition to VoIP we believe VoIP should be an eligible service for a defined time period, for example five years.

We agree with the proposal to allow exemption from no support of voice if there is no high speed broadband to and within the school or library. This will be particularly relevant for those schools and libraries in very remote or underserved areas.

55 – 62. We would like to propose two experiments as demonstration projects that will help validate the principles in this response. One is focused on internal connections in rural schools that lack school or school district IT staff and the other is focused on external connections and building truly open access external connections enabling increased competition facilitating lower broadband pricing for schools and libraries.

Internal Connections Experiment:

This experiment proposes to utilize the Illinois Century Network Regional Technology Center's (RTC) to assist rural schools and libraries in upgrading their internal connections. This will be done by utilizing an established reference architecture that will provide guidelines and rules regarding internal connection architecture for schools. We will also establish state master contracts for internal connection equipment where state contracts do not already exist and we will leverage bulk buying opportunities.

The purpose of the experiment is to see if an optimized (or "cookie cutter") approach can be taken to upgrading a school's internal connections, utilizing local RTC staff and making cost-effective purchases by using state master contracts and taking advantage of bulk buying (bulk buying within both the State and between States). The rural schools selected for this experiment will have no or limited IT staff on hand – the experiment will validate that internal connections can be upgraded with minimal/no support from the school IT staff.

The school, with assistance from RTC staff, will issue an RFP for upgrade of their internal connections utilizing an RFP template that will follow the internal connection reference architecture.

Data collected from this experiment will include:

- feedback from school staff regarding their time and effort needed
- pricing for the internal connection equipment
- discount level from market pricing for equipment based on both state master contracts and bulk buying.

The experiment will test the following items:

- The feasibility of RTC staff to implement an upgrade, according to the reference architecture, of the school and to demonstrate that this is possible even if the school does not have IT staff on hand.
- To test the reference architecture i.e. to test that one single reference architecture can be implemented in multiple different schools
- To validate that a state master contract with certain recommended devices and equipment to purchase is applicable for any school in the state
- To validate the timeframe and to test the timeframe that is needed to upgrade a schools internal connection architecture – this will allow to estimate how long it will take to upgrade a number of schools

- To arrive at data giving the cost to upgrade a school, thus providing a per classroom upgrade cost, and thus providing a total school upgrade cost based on the number of classrooms in the school
- To determine feasibility in making a partial internal connection upgrade of a subset of classrooms within the school. To achieve minimum online testing (PARCC) requirements may not necessarily require the upgrade of all the school, but would require an upgrade of a subset of classrooms.
- To validate that once the internal connection has been upgraded it can be handed over to the school with no issues, and without the school having to require technical resource.

External Connections Experiment:

This experiment will test the hypotheses that schools can contract with a service provider for lit service and fiber construction whereby four strands of fiber are owned by the school or owned on behalf of the school by a State agency. The service provider constructing the network and providing lit service will have the initial contract for 5 years, after which the lit service will be rebid to all service providers.

The four strands of fiber will be completely open access, meaning, will be available to any service provider following the initial contract term and interconnection to the four strands from any service provider will be allowed. The initial service provider will be responsible for maintenance of the school owned fiber strands and following the initial contract term, if another service provider wins the business they will be responsible for paying maintenance to the initial service provider.

Since the cost of deploying additional fiber strands beyond 4 is minimal when compared to the total construction cost, additional fiber strands will be allowed to be deployed and owned by the service provider performing the construction. This will provide further incentive, beyond winning the initial contract, for service providers to respond to the school RFP.

This experiment will test the following items:

- The willingness of service providers to entertain providing service to the school where four strands of fiber are owned by the school or an agency of the State.
- Validate the terms of the maintenance of the four strands of fiber and validate the contract that covers the maintenance of the four strands of fiber.
- The willingness of a school to own fiber. For schools that do not wish to own the fiber the State, or the ICN network could own the fiber on the school's behalf.

5 *Appendix A – Illinois Century Network*

The Illinois Century Network was established in 1999 to serve the needs of Illinoisans for education, training and information technologies. Today ICN, managed by CMS, is a broadband network providing high speed access to data, video and audio communications to more than 6,000 schools, libraries, colleges, universities, museums, local government, state agencies, hospitals and health centers. In August 2010, ICN was awarded a BTOP grant and state match of over $96M to expand and upgrade the existing ICN state network. The Illinois Broadband Opportunity Partnership project has constructed 1049 miles of new fiber and upgraded or purchased an additional 742 miles of fiber network.

For the 1049 miles of new construction, 144 strand count fiber is deployed on the backbone. Electronics have been purchased or upgraded throughout the network.

The new construction and upgraded network completed in December 2013 and there is now dark fiber and lit services available to the commercial sector in addition to community anchor institutions. The fiber route map is shown in the figure below.

Green: Constructed Fiber Network, **Blue:** Purchased Fiber Network

5.1 Illinois Regional Technology Centers

Illinois Department of Central Management Services has nine regional technology centers (RTC) strategically placed around the state, providing support, expertise and consulting to local schools and school districts. Each RTC has a wealth of experience in local broadband matters and helps schools and libraries with their broadband needs. The RTC's provide technical support regarding the school's connection to the ICN network as well as technical support regarding schools internal connections.

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