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The nature of E-rate policy and change, application process, and funding: influence on e-rate usage and technology over two decades

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THE NATURE OF E-RATE POLICY AND CHANGE, APPLICATION PROCESS, AND FUNDING: INFLUENCE ON E-RATE USAGE AND TECHNOLOGY OVER TWO DECADES

A dissertation submitted in partial satisfaction

of the requirements for the degree of

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by

Brett Allen Stoneberger

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Eric Hamilton, Ed. D. – Dissertation Chairperson

This dissertation, written by

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under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

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VITA

Brett Allen Stoneberger

PROFESSIONAL SUMMARY

I am inspired through helping others (individually or organizationally) by embedding myself as a trusted partner, colleague, and troubleshooter. I leverage 30 years of military, K-12, and higher education experience to provide leadership and technical know-how in the development of sustainable learning technologies, policies and procedures designed to make a positive and culturally sensitive impact on students and organizations. Since retiring from the Army in 2004, my professional efforts have focused on Bureau of Indian Education (BIE) funded schools across the United States. I have served as a teacher, technology specialist, student information system specialist, E-rate coordinator, and Facilities (FMIS/MAXIMO) information management support.

EDUCATION & PROFESSIONAL DEVELOPMENT

Doctor of Education, Learning Technologies,
Pepperdine University (GSEP), 2019

Master's degree, Management Information Systems,
University of Phoenix, 2010 (Honors Graduate)

Bachelor of Science Degree, Information Technology/Information Security
University of Phoenix, 2008 (Honors Graduate)

U.S. Army Cadet Command Instructor Course (80 Hours)
College/High School Teaching Certificate, 1998/2004

United States Sergeants Major Academy (459.5 Hours)
U.S. Army Leadership and Management School 2003

U.S. Army First Sergeant Academy (80 Hours)
U.S. Army Leadership and Management School, 1995

U.S. Army Operations and Battle Staff Academy (240 Hours)
U.S. Army Leadership and Management School, 1994

U.S. Army Advanced Leadership Academy (240 Hours)
U.S. Army Leadership and Management School, 1991

U.S. Army Recruiting Commander's Course (120 Hours)
Advanced Sales and Management, 1988

U.S. Army Recruiter's Course (240 Hours)
Sales and Management, 1986

U.S. Army Basic Leadership Academy (240 Hours)
U.S. Army Leadership and Management School, 1985

PROFESSIONAL WORK EXPERIENCE

Independent Consultant (Technology and Facility Operations Consultant) – 12/2013 to present

Bureau of Indian Affairs (E-rate and Technology Plan Coordinator) – 02/2009 to 12/2013

Bureau of Indian Education, (Technology Planning and Student Information Systems Coordinator) – 04/ 2007 to 02/2009

Independent Web Developer, and Technology Consultant – 08/2003 to 04/2007

Bureau of Indian Education, (High School Junior ROTC Instructor)– 04/ 2007 to 02/2009

Clear Solutions International, Inc. (Manager, R&D / Safety and Productions Supervisor)- 03/2004 to 09/2005

US Army (Infantryman through Sergeant Major) – 08/1980 to 03/2004

PUBLICATIONS

Authored two military reference books titled: Combat Leaders Field Guide, 12th Edition and Combat Leaders Field Guide 13th Edition; published by Stackpole Books Publishing (http://www.stackpolebooks.com). (ISBN: 0811731952)

I am cited in several articles and one book for my actions in Bosnia. Colonel David Hackworth (U.S. Army, Ret) wrote most of a chapter on my infantry company in his book Hazardous Duty. The chapter is called "Desolation Gulch: The Balkans, 1996." The chapter discusses my professionalism and says that I ran a "first class outfit" and that I was an excellent infantry company first sergeant. The following internet links also have some stories about my unit's efforts in Bosnia.

- *http://www.hackworth.com/23jan96.html*
- *http://www.hackworth.com/30jan96.html*

Additionally, Newsweek International Edition published an article about my unit, and I received special leadership mention as the company first sergeant. The article was written by Colonel David Hackworth (U.S. Army, Retired) an appeared in the January 29th, 1996 edition. The article was titled after my quote "It's Gonna Be a Long Year."

ABSTRACT

The purpose of this case study was to develop a comprehensive understanding of the real-world issues encountered by applicants attempting to realize opportunities available through the E-rate program. With multiple changes in the E-rate program spanning nearly two decades, it is necessary to understand what E-rate applicants have experienced, and what the impacts of those experiences are (past, present, and future). This study explored a micro version of the E-rate program as experienced by two small and remote Bureau of Indian Education (BIE) funded K-8 schools on the Pine Ridge Indian Reservation in South Dakota since 1998.

Chapter 1: Introduction

Since 1998, the Federal Communications Commission (FCC) has provided public and private schools and libraries in the United States with financial discounts for eligible telecommunications services through a program commonly known as E-rate or the Universal Service Administration Corporation (USAC), Schools and Libraries Division (USAC, 2016d). Currently, the E-rate "program funding is based on demand up to an annual Federal Communications Commission (FCC)-established cap of $3.9 billion" (FCC, 2017c, p. 1). E-rate's advent was a portion of the 1996 Public Law 104-104, the Telecommunications Act of 1996 (Chaplin, 2001).

The sense of urgency in the United States can be traced to the end of World War II and the introduction of the Soviet Union and its communist influence on the world. The Cold War produced competition between the United States and the U.S.S.R. in an effort to dominate technology, military might and "political-economic" systems (History.com Editors, 2016). The Korean conflict, the Soviet Union's launch of Sputnik in 1957, and the Cuban Missile Crisis only exacerbated the United States' need to improve its position of influence in the world. These efforts increased over time and produced a sense that the nation was in trouble and influenced national efforts calling for improvements in education and access and use to better technologies to improve U.S. position in the global environment (History.com Editors, 2016).

Though not detailed in this study, the Telecommunications Act of 1996 was largely a result of the preceding and troublesome "Cold War" years and reports like David Gardner's, which followed well into the early 1990s (Gardner, Larsen, Baker, Campbell, & Crosby, 1983). In August of 1981, the National Commission on Excellence of Education was formed. Secretary of Education T.H. Bell directed this commission to examine and report on the state of education

by April of 1983 (Gardner et al., 1983). The resulting report (chaired by David Gardner), was titled *A Nation at Risk: The Imperative for Educational Reform* and recommended new graduation requirements and emphasized current technology integration within curriculum. Gardner's report investigated and made recommendations to "the declining state of the educational system in America, as measured by high school student performance in the United States and other countries" (Gardner et al., 1983, p. 1).

Gardner et al.'s *Nation at Risk* cited several indicators of national risk; one of these outlined a chief complaint that business and military leaders were required to spend millions of their own money to bring employees and recruits up to basic skills needed for the job. These included reading, mathematics, writing, and spelling. He quoted the U.S. Navy reporting (Gardner et al., 1983):

> That one-quarter of its recent recruits cannot read at the ninth grade level, the minimum needed simply to understand written safety instructions. Without remedial work they cannot even begin, much less complete, the sophisticated training essential in much of the modern military. (p. 9)

Amongst other competencies, the report accredited computer competence as one of skills necessary for succeeding in formal education and the future job market – that the above indicators and insufficiencies are present in a time when the "demand of highly skilled workers in new fields is accelerating rapidly" (Gardner et al., 1983, p. 10). *The Nation at Risk* further emphasized that each aspect of our lives is being pierced by computing and that technology is rapidly converting the nation's work-related standards. Further, Gardner quoted a colleague, Paul Hurd as saying: "We are raising a new generation of Americans that is scientifically and technologically illiterate" (Gardner et al., 1983, p. 10).

Two other national level reports (Doyle, 1992; United States Department of Labor, 1991) emphasized the importance of technology as a critical component to preparing students for the

working market or in continuing their education. The 1991 Department of Labor SCANS (*The Secretary's Commission on Achieving Necessary Skills*) report added technology into a group of five top competencies, "Technology – selecting equipment and tools, applying technology to specific tasks" (United States Department of Labor, 1991, p. 5). The Doyle study was drawn from the National Forum on Information Literacy (NFIL), representing 46 "national organizations interested in improving information literacy" (Doyle, 1992, p. 1). Within this study, they reference the SCANS report and define the concept of information literacy as students having the ability to work with multiple technologies to draw information from those technologies.

Along with the national reports and studies above, a few dozen other national level reports, studies, and books circulated mainstream education and sought policy change to thwart the nation "at risk" scenario. Thousands of educational entities influenced by this new information scurried to implement improvements. Many schools would spend enormous amounts to infuse their campuses with available technology (Peslak, 2004). Viewing a timeline between 1983 and 1998 national statistics show in 1983, schools had approximately one computer for 125 students and by 1996, these numbers grew to one computer for every nine (Wenglinsky, & ETS Policy Information Center, 1998).

Unfortunately, these statistics were often used for a measurement of success or failure; essentially, count the computer to student ratio and close the report or study. It wasn't until the mid-1990s when the importance of actual use and technological pedagogy became important (Glennan & Melmed, 1996). Discerning methods of computer infrastructure and use, software, access, Internet connectivity, Local Area Network use, and whether technology use influenced improved learning became important research questions. Further research shows that in 1994

Internet connectivity in classrooms was only at 3% and network use in our nation's schools was at 38% (Coley, Cradler, & Engel, 1997). While these numbers increased overtime, there was disparity amongst schools with higher levels of impoverishment versus those in better financial condition.

A report titled *Fostering the Use of Educational Technology, Elements of a National Strategy* (Glennan & Melmed, 1996) likely influenced both technology and policy innovation. The authors believed that persistent development of technology and identification of guiding principles within the nation's schools would assist the national effort for school improvement. Their report centered on answering three research questions (Glennan & Melmed, 1996):

1. What do we know about the use and effectiveness of computer and network-based technology in elementary and secondary education?
2. What major strategies should the nation consider as it seeks to make effective use of technology in its schools?
3. What are the most important roles for the federal government to play (p. xiv)?

Glennan & Melmed's report reiterates the national calling for school improvement and technology integration in the nation's schools. Their data revealed that in 1994, U.S. "public elementary and secondary schools spent approximately $3 billion to purchase educational technology" (Glennan & Melmed, 1996, p. 1). Despite all the attention given to school improvement, they found only a few examples of schoolwide use of technology. On average, technology instruction was normally limited to select classroom teachers, and only a few schools had "embraced technology and used it to transform the content and mode of instruction" (Glennan & Melmed, 1996, pp. 1-2).

Determined to move beyond the average, Glennan & Melmed did however, manage to find and assess five well financed schools in which "curriculum and instruction have been changed, and the school day is reorganized to make effective use of technology" (Glennan &

Melmed, 1996, p. 24). Glennan & Melmed invited these schools to a 2-day workshop and with consults from leading experts, they gathered information in order to outline best practices of that time. Each school was surveyed independently in addition to presenting their own evidence on how their school's use of technology enhanced their efficiency and student knowledge. Though, abundant evidence was unavailable at the time, they did suggest that technology can be used to enhance pedagogy for teachers and students and increase overall learning objectives (Glennan, 1996).

The National Telecommunications and Information Administration (NITA), is the fundamental office responsible for advising the President on telecommunications and information policy (largely broadband issues) (NTIA, 2016). In 1995, they issued a report titled *FALLING THROUGH THE NET: A Survey of the "Have Nots" in Rural and Urban America*. This report (the first in a series of four), reported and advised on the expansion of accessible and fair telephone infrastructure. Essentially, in order for the population to effectively gain access to global information offered through growing Internet services, telephone companies needed to expand their services to accommodate these needs (NTIA, 1995). NTIA's report generated data using "information gathered according to several specific variables (*i.e.*, income, race, age, educational attainment, and region) and three geographic categories -- rural, urban, and central city" (NTIA, 1995, para.4). These variables and categories coined the term "universal services" or the need for equal services across the country; commonly referred to as bridging the "digital divide" of the time (House, 2000).

The Clinton Administration's early years coupled with the NTIA and a myriad of other reports and studies, sought reasonable access to computers, networks and Internet access. The availability of these tools was a portion of the solution to grow a nation in trouble by providing a

more competitive workforce, improve schools and education, and improve the disparity that existed in accessing global information. As a result, the legislative process in Washington began and in 1996, the Telecommunications Act was enacted.

E-rate – Background and Brief Overview

Interestingly, an excerpt from the book: *Bridging the Digital Divide: Technology, Community and Public Policy* (Servon, 2002) defines the "digital divide" as such:

> Two challenges faced me as I wrote this book. First, technology (and the digital divide in particular) is a moving target. As I write this, I worry that during the six months between the moment I sit here at my computer and the day the book exists as a physical object everything thing will change. Keeping the threat of short shelf-life in the front of my mind, I have worked to create a book with messages that last beyond the immediate accuracy of specific statistics. Second, the range of material that I needed to understand and include expanded endlessly. It sometimes seemed as though I was putting together a giant jigsaw puzzle, and that I never encountered those straight-sided pieces that border the whole. (p. xv)

Working with E-rate since 2005 and discussing the program with hundreds of schools and colleagues, one could develop a "moving target" perception of the E-rate program as well. It could be argued that the E-rate program has been in a race to provide funds to schools and libraries for telecommunications services and simultaneously, has been held responsible for keeping up with enormous technology infrastructure and delivery changes since 1997. This appears to have caused a fevered pace of change during every year of the E-rate program; change often comes hard for the various stakeholders linked to the E-rate funding process. It is a hope that this study analyzes and reports positive and negative aspects of this environment that will assist participants in future E-rate endeavors.

The E-rate program was designed as a discount subsidy to assist schools and libraries to trim the cost of eligible telecommunications delivery services. The "E" in E-rate stands for Education or Education-Rate – a subsidy fund available for schools and libraries for the purpose

of enhancing education through technology delivery (USAC, 2017a). From the first year of E-rate through 2015 funding requests, the E-rate program has committed approximately $42.5 billion to applicants seeking eligible telecommunications discounts (USAC, 2018c). E-rate currently funds five eligible telecommunications services: "Data Transmission Services and Internet Access, Voice Services, Internal Connections, Managed Internal Broadband Services, and Basic Maintenance of Internal Connections" (USAC, 2017q, p. 1).

E-rate subsidies are only available to accredited schools and libraries – a term known as an eligible entity. An eligible entity is considered an "applicant" (schools and libraries), or to consortia of these entities. A school must be non-profit and meet the definition in accordance with the No Child Left Behind Act (U.S. Department of Education, 2018). "Libraries must meet the statutory definition of library or library consortium found in the 1996 Library Services and Technology Act (LSTA; Pub. L. 104-208) and must be eligible for assistance from a state library administrative agency under that Act" (USAC, 2017o, p. 1). As a result, the E-rate program will provide eligible subsidies to most schools and libraries in the United States.

When an applicant applies for E-rate funding, they are seeking a discount to an amount of money to assist with the eligible service within their organization. For instance, if a school is paying for an Internet Service Provider (ISP) for Internet services (bandwidth), they determine an annual cost for that service and request a discount through the E-rate program. If they pay $12,000.00 per year for the bandwidth, they apply for a discount to that service. School and library eligibility discounts (USAC, 2017ab) for eligible services range from 20-90 percent based upon the applicant's level of impoverishment, which is derived from their enrollment status in the National School Lunch Program (NSLP) or alternate mechanism (USDA, 2017). The higher the level of impoverishment, the higher the discount can be (up to 90%). Applicants calculate

their overall discount using the most current discount matrix located on the SLD website (USAC, 2017f).

Once the applicant has proven eligibility and determined their level of discount, they begin navigating the E-rate application and funding process (Figure 1). The E-rate program is very similar to other government subsidy and grant programs, but often very detailed and arduous. The applicant reviews the program rules, develops a plan, applies for eligible services and discounts, awaits a review process, awaits a funding decision, utilizes the funding, prepares reports, and files all correspondence (USAC, 2016b). Directly linked to the applicant's process are service providers, who will bid on and provide the eligible services the applicant is seeking discounts for. Service providers have their own rules and processes and must also go through an eligibility and identification process (USAC, 2016c).

E-rate funding is applied for annually within a window of time in what is termed a "funding year" (USAC, 2017p). A funding year (FY) is defined as a time during which program support is being provided. The FY begins July 1 and ends June 31 of the following calendar year (USAC, 2017p). For FY 1998, an applicant likely applied for funding during the Fall of 1997 and receive funding at some point in 1998 or later. There are different terms for a funding year (USAC, 2017p); in the above example, one might hear 1998 called "E-rate Year 1" (the first year funding was ever available) or "Funding Year 1998" (the year funding became available for that year).

Currently, eligible applicants can apply for E-rate funding under two categories: Category One (formally Priority I) includes Data Transmission Services and Internet Access, and Category Two (formally, Priority II) includes Internal Connections, Managed Internal Broadband Services and Basic Maintenance of Internal Connections (USAC, 2017p). E-rate funding utilizes many

program rules, one of these is an Eligibility Services List (ESL) that provides applicants and service providers a list of services that they can apply and provide services for (USAC, 2017p). Each of these services falls within a category of service mentioned above. Interestingly, the ESL has changed every program year since 1998 (USAC, 2016a). A common misconception is the belief that E-rate funding supports classroom technologies such as computers, smart devices, learning software, or technology training; these are not eligible for E-rate funding (Revenaugh, 1999). A common assumption is that applicants will save money using their E-rate subsidy and be able to re-invest that savings into non-E-rate eligible equipment (Revenaugh, 1999).

This short introduction into E-rate only skims the intricacies of the of the program or the policy behind it. Chapter 2 (Literature Review) will provide a thorough overview of the program, policy and literature.

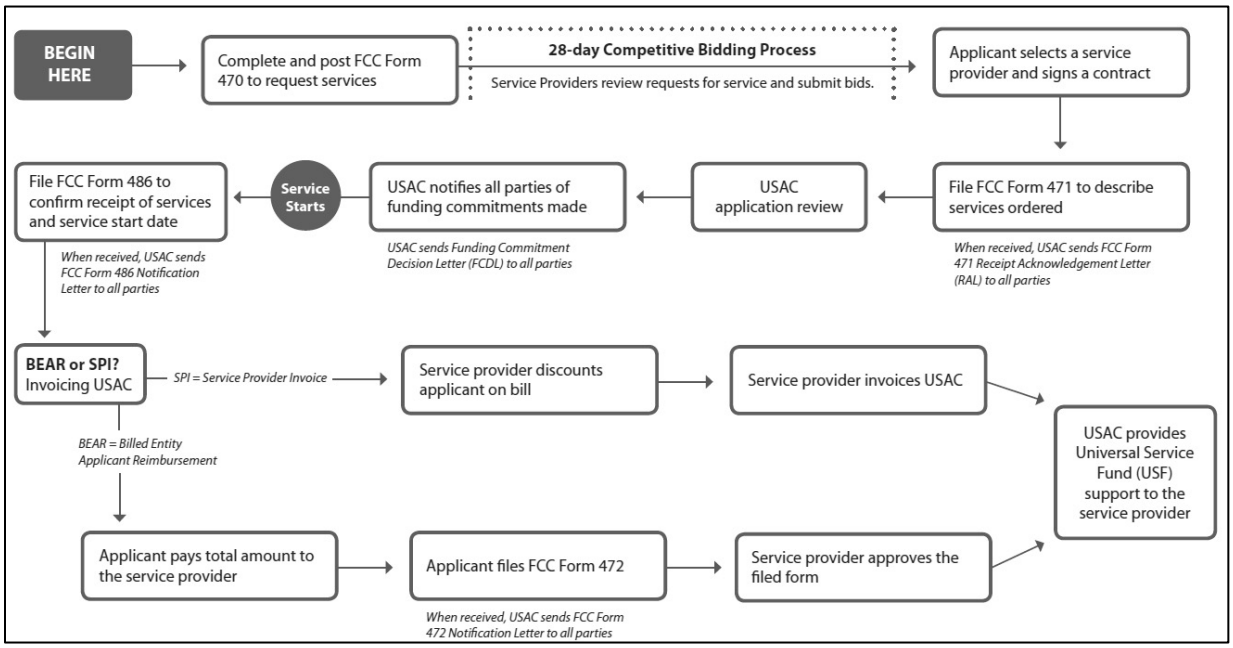


Figure 1. E-rate application process. From "Schools and Libraries (E-rate) Program Application Process," by the Universal Service Administrative Company, 2019 (https://www.usac.org/wp-content/uploads/e-rate/documents/Handouts/application-process-flow-chart.pdf). Copyright [2019] by Universal Service Administrative Company. Reprinted with permission.

Purpose of the Study

The purpose of this case study was to develop a comprehensive understanding of the real-world issues encountered by applicants attempting to realize opportunities available through the E-rate program. The study's outcomes confirming the receipt of services sought to determine how E-rate policy change, application processes, and funding influences E-rate usage and technology. Lastly, this study hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from this powerful funding source.

With multiple changes in the E-rate program expanding two decades, it is necessary to understand what E-rate applicants have experienced, and what the impacts of those experiences are (past, present, and future). This study explored a micro version of the E-rate program as experienced by two small and remote Bureau of Indian Education (BIE) funded K-8 schools on the Pine Ridge Indian Reservation in South Dakota since 1998.

Statement of Problem

The successful navigation of the E-rate process and the ever-changing rules conveyed by government policy escalates an obvious, but implied problem. E-rate is convoluted and often arduous for applicants to realize successful funding. The E-rate process can create difficulties in both applying and in receipt of funding. Policy change affecting E-rate can cause anomalies and other variables that were not planned for. Additionally, applicants must remain technologically current so they can determine "how" and "why" E-rate funding can influence their technology – did they make good choices and what direction should they go next?

The E-rate problem then, could be categorized into three areas: Applicant understanding of the E-rate process and proper utilization of funding, the impacts of policy change on E-rate processes and funding, and determining what influences E-rate funding has on the applicant's

educational technology needs. This study's analysis of these problems uncovers significant data to inform schools and policymakers how to better manage and derive benefit from the E-rate program.

Significance of the Study

From a layman's viewpoint, E-rate can be a daunting exercise, riddled with rules, processes, policy change, program change, accountability, and occasional heartbreak. Like any new program, E-rate had a beginning – the former VP of Outreach and Education for E-rate (1998-1999), Mickey Revenaugh explained it this way (Revenaugh, 1999):

> If you've just come into contact with the E-rate in this century, you're like a computer user who didn't have to deal with DOS. You're lucky, because you never had to do it the hard way. I know, because I was there. For the first two years of the E-rate, my job was to explain the program and all of its complexities to the thousands of schools, districts, and libraries who could benefit from the funds. That meant I had to actually understand it as it evolved. If anyone could have used a "Dummy's Guide to the E-rate," it was me! (p. 1)

Applicants must be educated on the E-rate process and have a plan before they can apply. The various processes following application vary depending upon receipt and response to communications from the SLD. Proper applicant-to-service provider correspondence, invoicing, and relationships must be followed. Additionally, applicants must be able to manage the current E-rate funding year, past funding years, and plan future technology impacts and funding needs. Applicants are continuously subject to reviews or audits seeking information from a current or past application (USAC, 2017ag). This study sought to gain valuable insight into this phenomenon and provides guidance to E-rate applicants, policymakers, and other stakeholders in an effort to improve this federal subsidy program.

The Bureau of Indian Education (BIE) is formerly known as the Office of Indian Education Programs (OIEP), and was renamed and established on August 29, 2006 to reflect the

parallel purpose and organizational structure BIE has in relation to other programs within the Office of the Assistant Secretary-Indian Affairs (DOI/ED Indian Education Study Group, 2014). The BIE falls under the purview the Office of the Assistant Secretary-Indian Affairs and contracts much of its support, including Information Technology from the Bureau of Indian Affairs (BIA).

The BIE is responsible for administering the only national education system for American Indian children and adults. "The BIE oversees a total of 183 elementary and secondary schools, located on 64 reservations in 23 states. Of these, 57 are BIE-operated and 126 are Tribally-Operated under BIE contracts or grants" (DOI/ED Indian Education Study Group, 2014, p. 1). Federal laws, treaties, and court decisions mandate the education of Indian children as a federal responsibility. The BIE is the only federal entity that regularly participates in the E-rate program. Therefore, any empirical analysis on BIE School E-rate application procedures, use and impact, will assist American Indian schools, policymakers and stakeholders to better manage and derive benefit from the E-rate program.

This is likely the only dissertation and formal study relevant to the E-rate program on Bureau of Indian Education (BIE) Schools on the Pine Ridge Indian reservation. There was one E-rate study on American Indian populated schools and BIE applications in 2001(Chaplin, 2001), which compared funding percentages to non-Indian schools. However, this study did not explain the intricacies involved in the E-rate process or the nature of the program as experienced by the participants.

Research Questions

This study sought to uncover the experience of two small and remote Bureau of Indian Education (BIE) funded K-8 schools on the Pine Ridge Indian Reservation in South Dakota since

1998. To accomplish this, three research questions were used to intensely investigate how the nature of the E-rate program policy, application processes, and funding has influenced and impacted applicants based upon their experiences over time. These questions gained insight into the E-rate phenomenon that provide useful recommendations for E-rate applicants, policymakers, and stakeholders to implement better procedures and policy, or derive more benefit from the program.

Significant data uncovered was helpful in answering the following research questions and will add to this body of knowledge.

1. How has the nature of FCC E-rate Policy and Program change influenced the usage of E-rate?
2. How has the nature of FCC E-rate Application process influenced the usage of E-rate?
3. How has the nature of FCC E-rate funding influenced technology and technological infrastructure?

Limitations

E-rate is a government policy; as such, it has experienced change since its inception in 1998. These changes require proper dissemination so applicants, especially highly impoverished ones can be armed with the most current information and lessons learned. This study holds two beliefs common to the E-rate program that could be defined as limitations. First, the E-rate program has succumbed to hundreds of changes effected by policy, public opinion, and technological change. It is doubtful that any person or entity can effectively keep up with all the changes. Thus, there will remain an unavoidable cycle of impact, both positive and negative resulting in this change. Two, regardless of the problems experienced with the E-rate process, if

schools follow proper procedures and remain diligent, they will experience more positive outcomes than negative.

Delimitations

When discussing E-rate's impact on technology and technology infrastructure, this study is referring to the funding of eligible technologies and how they were integrated into the school in a manner that did or did not support organizational technology goals. For instance, where were these schools technologically when they first began using E-rate and where are they now? What types of equipment and services are being funded and how have they helped or hindered technology in the school? What are the requirements placed on the E-rate applicant (human, technical, educational, location, impoverishment…) in order to integrate technology?

This is not a study about educational technologies, classroom technologies or pedagogy, or how to prepare a school for technological success. Therefore, if a school in this study experiences increased classroom connectivity and bandwidth through E-rate subsidies, that doesn't necessarily translate into improved learning or assessment scores.

Summary

Educational entities, libraries and educational authorities use a myriad of methodologies to plan, fund, maintain and execute their technology programs. E-rate is an available national policy-driven funding source that may assist those eligible and capable to use it. The hope of this study is to illuminate E-rate as a positive funding asset; but, also an asset with rules and procedures, one that changes with policy and technological capability, and requiring diligence and accountability.

Chapter 2: Literature Review

Public Policy Framework

Many academics disapprove of the notion that public policy can be a field of study. They argue that it lacks focus to any one discipline, lacks essential research question capacity, accommodates no original problem, fails to amalgamate a theoretical framework, and employs no distinctive approaches or investigation (K. Smith & Larimer, 2016). A typical example of such derision, K. Smith & Larimer (2016) use a study by Kenneth Meier (Meier, 2009) and describes "policy research as 65 variables explaining 25 cases" (K. Smith & Larimer, 2016, p. 1). However, from a research perspective, there has been a multitude of activity over telecommunications equality and the E-rate program over the last twenty years. Policy decisions and changes including Senate hearings, studies, reports, program processes, and discussions on telecommunications equality and the E-rate program, are abundant and readily available.

This dissertation does not argue the merits of policy being a field of study, but uses existing concepts to recognize that public policy is ambiguous in nature and changes continuously (Peters, 2012; K. Smith & Larimer, 2016). To facilitate transparency, this study accepts Peter's restrictive approach that "the sum of government activities, whether pursued directly or through agents, as those activities have an influence on the lives of citizens" (Peters, 2012, p. 44). The nature of this policy framework does not focus on the "how and why of policymaking" (K. Smith & Larimer, 2016, p. 6). Asking questions such as why E-rate policy has changed over time, how and whom affected E-rate policy, and where policy originates would not be especially productive. The impacts of E-rate policy and program change are realities that warrant examination and legitimacy. This review of literature seeks to summarize positive and

negative experiences and impacts that are a result of E-rate policy, program change, application process, and funding.

According to the U.S. Department of Education (USDOE), E-rate has been a national policy since 1998, and it seems E-rate subsidies will continue at least into the near future (USDOE, 2014). Peter's characterizes the choices, outputs, and impacts levels of policy (Peters, 2012); the latter is one of the goals of this study. Policy choices are normally made at the decision-maker level of power – in that when they are made, the lives of citizens at national, state and/or local level are affected (Peters, 2012). When policy choices gain momentum and are officiated, they become active strategies requiring resources, management, and rules. This process makes them policy outputs – often "synonymous with the term program" (Peters, 2012, p. 5).

E-rate was introduced as a policy choice in 1998 and was quickly implemented by the top levels using USAC and the Schools and Libraries Corporation (SLC) as the output agents (FCC, 1996). Information exchange, program interpretation and handover from a federal agency (FCC) to a non-governmental agency (SLC) commenced. Additionally, the SLC prepared and disseminated program procedures and timelines to other entities across the United States. These entities included state and local governments, educational agencies, school districts, libraries and other eligible E-rate applicants and stakeholders.

In 1998, internet usage in the United States was measured at 28% for rural areas, and 34% for urban areas (Carlson & Goss, 2016). This fact likely impeded the communication of information to the entities mentioned above. Thus, low rates of internet access across the country caused information dissemination on E-rate policy and procedures to be more dependent upon other forms of diffusion, such as U.S. Mail, faxes, conferences, and telephone. With such a

"wide range of actors and ideas" (Peters, 2012, p. 59), the progression from E-rate policy choice, output and impact would be viewed and processed at many different levels and times by those involved and directly impacted.

The FCC E-rate program has been providing public and private schools and libraries in the United States with financial discounts for eligible telecommunications services since 1998. Currently, the E-rate "program funding is based on demand up to an annual Commission-established cap of $3.9 billion" (FCC, 2017c, p. 1). This chapter's purpose is to expose empirical knowledge and to argue E-rate's effectiveness and ambiguity resulting through review of credible studies, reports, policy, and discussions since its inception (Machi & McEvoy, 2016).

The remainder of this chapter is organized into three topics reviewing literature that is linked to the study's three research questions. With respect to this study's research questions, each seeks answers to the nature of a separate topic. The first topic will cover E-rate policy and program change; the second, the E-rate application process and change; and lastly, E-rate funding and its impact on technology and technology infrastructure.

Although, each topic is distinct from the other, they are closely linked and may be casual of another. For instance, policy change may beget a change in the application process; a change in the application process may cause influence funding availability. Likewise, a faulty application process may cause the need for policy change, such as audit results instituting improved oversight policy.

FCC E-rate Policy and Program Change

The "digital divide" dilemma stirred the need for change in America – a primary nexus to this was the inequality of ubiquitous telecommunications services across our nation (Carvin, 2000). The 104th Congress of the United States assembled, drafted and enacted the

Telecommunications Act of 1996 (Carvin, 2000; FCC, 1996). Within this policy, Congress emphasized the inability of the current marketplace stating that they, "acknowledged that the market would not deliver ubiquitous service to poor communities" (Carvin, 2000, p. 8).

The Telecommunications Act of 1996 involved the first national policy in telecommunications in nearly 62 years (FCC, 1996), and completely overhauled the Telecommunications Act of 1934. The Telecommunications Act of 1996, though diffusive in nature, had a goal to provide open competition amongst telecommunications carriers in such a manner that fair services (telephone, internet, cable, and video), could be offered to or utilized by the entire population.

Emphasized in this act was the need to offer services to schools and libraries across the nation that would reduce disparity, affecting entities that were either highly impoverished, located in rural or inner city settings, or a combination of both (FCC, 1996). The Telecommunications Act of 1996 provided both direction and foundation to the commission (FCC) and the states to (FCC, 1997):

> Devise methods to ensure that "consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas . . . have access to telecommunications and information services . . . at rates that are reasonably comparable to rates charged for similar services in urban areas…the Commission to define additional services for support for eligible schools, libraries…to establish competitively neutral rules . . . to enhance, to the extent technically feasible and economically reasonable, access to advanced telecommunications and information services for all public and non-profit elementary and secondary school classrooms…and libraries. (p. 5)

As a result, on May 7, 1997, the FCC delivered their *Report and Order in the Matter of Federal-State Joint Board on Universal Service. CC Docket (96-45)* (FCC, 1997). This report outlined actions taken and planned by the FCC to meet congressional goals outlined in the Telecommunications Act of 1996. In short, these goals would establish a means to "encourage

the development of competition in all telecommunications markets…to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans" (FCC, 1997, p. 6).

In September of 1997, the FCC announced, "the members of the three corporations (USAC Board of Directors, Schools and Libraries Corporation Board of Directors, and Rural Health Care Corporation Board of Directors) would be charged with implementing federal universal service support mechanisms" (FCC, 1998). The Universal Services Administrative Company (USAC) would direct the efforts of a subordinate company called the Schools and Libraries Corporation (SLC), known by many as E-rate (USAC, 2016d). In 1998, the FCC directed the SLC to merge with a corporation named Rural Health Care Corporation (RHCC) and effective January 1, 1999, the SLC would change its name to the Schools and Libraries Division or SLD (FCC, 2017e).

USAC is the primary corporation designated to administer an FCC fund known as the Universal Service Fund (USF). USF existed prior to the Telecommunications Act of 1996, and functioned as a "mechanism by which interstate long distance carriers were assessed to subsidize telephone service to low-income households and high-cost areas" (FCC, 2017e). The Telecommunications Act of 1996 modified USF's definition to include access to cost effective telephone service for nationwide schools and libraries and rural health care providers (FCC, 2017c). Though several changes have taken place over the years, today USAC distributes USF funds to administer funding support for four programs:

1. Schools and Libraries Division: provides telecommunications subsidies to keep students and library patrons connected to broadband and voice services (FCC, 2017e).

2. Rural Health Care: “Supporting healthcare facilities in bringing world class medical care to rural areas through increased connectivity” (FCC, 2017e, para. 4).
3. Lifeline: “Helping households obtain the communications services they need to participate and function in today's digital world” (FCC, 2017e, para. 5).
4. High Cost: “Providing funding to companies working to expand connectivity infrastructures in unserved or underserved areas” (FCC, 2017e, para. 6).

Though many studies claimed large funding levels in E-rate’s early years, irregularities, shortcomings, and even program rule violations began to surface. From 1998 through 2002, there were 34 separate program rulings affecting E-rate program rules and limited policy (USAC, 2017m). In total, from E-rate’s inception in 1997 through May 8, 2015, there have been “161 Major FCC Orders and Rulemaking Notices regarding the Schools and Libraries (E-rate) Program” (USAC, 2017m, p. 1). As early as 2002, the FCC in coordination with the Schools and Libraries Division’s program review team began seeing anomalies in the E-rate program which required modifications to policy and the E-rate program (USAC, 2017m).

Oversight. Even before 2002, E-rate program oversight had become reality. Shortly after the Schools and Libraries Corporation began their first year of E-rate subsidies, the General Accounting Office (GAO) gave its first testimony before the U.S. Senate’s Committee on Commerce, Science, and Transportation (England-Joseph, J. A., & United States. General Accounting, O. (1998). The report outlined that the SLC had made significant progress in establishing itself, setting up its business presence, disseminating information to the public and potential applicants, and was “consistently meeting the operational framework for the program consistent with the FCC orders” (England-Joseph et al., 1998, p. 1). However, the GAO did have several areas of concern.

The first concern documented the need for closer FCC oversight because the SLC was still very much in start-up mode. Because the Telecommunications Act did not outline a specific agenda, the SLC was left to its own interpretations of establishing the subsidy program. The SLC only began with a 14-member staff and "contracted out most of its application-processing, client support, and review functions to the National Exchange Carrier Association (NECA)" (England-Joseph et al., 1998, p. 3). NECA then subcontracted client support services, website development, and application processing to another organization.

With the amount of disparity caused by this haphazard structuring, several ancillary problems surfaced. The SLC had failed to conclude internal processes (procedures, computerized systems, and controls) to fund applicants and provide service provider compensation. The GAO concluded that "this approach would have put the Corporation at risk of being unable to process nearly $2 billion in vendors' invoices in a timely manner" (England-Joseph et al., 1998, p. 9). As a result, the GAO recommended the SLC should make no funding commitments until they finalized program procedures. In addition, the FCC decided to alter the entire funding year from a "calendar year cycle to a fiscal year cycle, and the period for the first round of funding was changed from 12 months to 18 months" (England-Joseph et al., 1998, p. 10). Repercussions from this order also regulated funding dollar caps during 1998 and for the first half of funding year 1999. The SLC was limited to committing "$1.925 billion" (England-Joseph et al., 1998, p. 10). This amount of money did not nearly cover the national request for eligible funding.

As a result, the FCC issued policy directing the SLC to only fund requests for telecommunications services and internet access (Category One service). Once all the Category One requests were funded, the SLC was given permission to fund the most highly impoverished

applicants for Category Two services. Even though Category Two funding was eventually disbursed, many applicants that were not in the highest levels of impoverishment did not receive funding for Category Two services. Though data mining for the entire United States would be a daunting task, an example of E-rate non-funding in 1998 for Category Two service was taken from the state of California to demonstrate the impact.

California applicants made 7,999 separate funding requests during the 1998 E-rate funding year. Of these, 4,655 were for Internal Connections and requested discounts totaling $146,195,349.10 dollars. There was a total of 1,809 Internal Connections requests for $40,939,739.33 dollars that were not funded. Of the 1,809 requests, 1,687 of them were denied funding because the SLD was simply out of funding. This data was taken from the SLC Funding Request Data Retrieval Tool (USAC, 2018c).

A second concern scrutinized the organization of the SLC. According to Gilroy in a report to Congress, the aforementioned GAO report also questions the very need for the SLC – that "it only adds 'new levels of bureaucracy' and siphons away money that could be used to fund universal service objectives" (Gilroy, 2001, p. CRS 2). Gilroy cites other concerns, including an initial operating budget of nearly $19 million, inflated employee compensation levels, and, most of all, debate over the FCC possibly exceeding its authority when it established the SLC (Gilroy, 2001).

This argument of the SLC's legitimacy continued, and ultimately, Congress ordered an SLC program restructuring. As a result, to preclude a Senate bill to restructure the SLC, the FCC was allowed to order the SLC to merge with its counterpart, the Rural Health Care Corporation (RHCC). This merger included the lowering of employee compensation and resulted in two entities being renamed to the Schools and Libraries Division (SLD). In addition, all other USF

entities, including the SLD, would fall under the central control of USAC (FCC, 2017e; Gilroy, 2001).

There were many other debates in the early years of the E-rate program, ranging from funding availability, in addition to whether the E-rate program should exist at all. These debates are beyond the scope of this review. This brief overview demonstrates E-rate policy change and ambiguity, which closely parallels the exhaustiveness and effect of legislative legitimacy.

Additionally, it reveals the impacts policy change can have on program oversight and the entities that derive impact from those policies or programs. Peters tells us that "governments are simply too large and involved in too many issues…" (Peters, 2012, p. 97). That is to say, an institution such as Congress cannot handle the full brunt of administering a policy once they have legislated a policy's framework. Once Congress enacts legislation, it is the norm for them to maintain a "degree of oversight," (Peters, 2012, p. 101) but also to pass the responsibility of implementation over to another government agency to further interpret and develop policy frameworks and program implementation (K. Smith & Larimer, 2016; Peters, 2012).

This was the case with the E-rate program in its inception as well as in the present. Actors in the E-rate program form a hierarchy of oversight, policy interpretation and program administration. This includes the top levels such as Congress and the FCC, through the middle program management of USAC and the SLD, through other supporting agencies and stakeholders such as state education agencies, school districts and finally, to E-rate applicants themselves.

Service eligibility and program integrity. Despite the above-mentioned policy difficulties, as a program, E-rate was still funding applicants for eligible services as of century's turn. According to one of several Benton Foundation Reports, *Great Expectations: Leveraging*

America's Investment in Educational Technology, "by the fall of 2000, 98% of public schools in the U.S. had access to the Internet." E-rate was credited for a portion of this success (Dickard, 2002, p. 9). This report also found that in the first two years of the E-rate program, nearly 60% of all funding requests were used to enhance internal connections. The remainder of the funds account for Telecom services and internet access (Dickard, 2002). However, there existed questions whether applicants were receiving funding for correct eligible services and at the discount rate commensurate with their entity's actual level of impoverishment (Gilroy, 2001).

As a result, in 2001, the Bush Administration directed the FCC to better "define the eligible services list to include those that promote the effective use of telecommunications, such as teacher training and software" (Dickard, 2002, p. 14). The teacher training and software aspect likely caused some confusion – the eligibility services list has been updated every year since 1998, and has never included teacher training or software. In fact, software and training has always been limited to services directly related to the movement of network data, such as the actual Network Operating System on a school server (USAC, 2017p). E-rate funding has never included services related to user-level software or the training of teachers unless it was related to an eligible service, such as training a teacher (user) how to use a new phone system discounted with E-rate subsidies.

Gilroy reported concerns with the initial eligibility services list, that some of the initial applications might contain ineligible items. This prompted the FCC to reiterate the current eligibility services list, including what services were not eligible for funding (FCC, 2017d; Gilroy, 2001). Within this document, the FCC also restated that applicants must select "the most cost effective bid" (Gilroy, 2001, p. CRS 8) when exploring service provider quotes, but that other factors could also be considered. Other factors considered by the applicant were listed as

"prior experience; personnel qualifications, including technical excellence; management capability, including schedule compliance; and environmental objectives" (Gilroy, 2001, p. CRS 8). The addition of including "other factors" introduced the possibility of manipulation of service provider selection as another application integrity concern. A deeper concern was whether the SLD had the resources to properly oversee program rules. Ultimately, the SLD established a whistleblower hotline and a task force to use recommendations to enhance E-rate (Gilroy, 2001; USAC, 2017al). The GAO continued to issue reports on concerns over the next several years.

At Senator McCain's request, the GAO issued a follow-up report in the Spring of 1999 (United States General Accounting Office, 1999). This report expressed the need for the SLD to ensure applicants are legitimately certifying their discount levels. The GAO also informed Congress that the FCC had yet to comply with earlier recommendations "to develop adequate goals, performance targets, and measures for the program" (United States General Accounting Office, 1999, p. 5).

Resulting in an audit of E-rate's first two years, the GAO issued further recommendations in December 2001. This report (United States General Accounting Office, 2000) claimed that ineligible services had been funded in the millions of dollars due to lack of oversight. Additionally, the report claimed the "$1.3 billion or 35% of the committed funds went undisbursed several months into the next program year. (Gilroy, 2001). After additional FCC and USAC oversight, the GAO and FCC further reported that by the end of April 2001, undistributed funds had lowered to approximately $770 million (Gilroy, 2001; United States General Accounting Office, 2001).

The FCC took additional steps using their Office of Inspector General (OIG) to audit the E-rate program. Issued in October 2002, the OIG stated three concerns: "lack of resources for adequate oversight; inadequate competitive bidding requirements; and no suspension or debarment process (FCC, 2002a, p. 2). The latter dealt with service providers and applicants that knowingly violated E-rate program rules. Over the next several years, the OIG's theme for the E-rate program reported incidents of noncompliance, fraud, waste, abuse, and a general lack of quality assurance resources (FCC, 2002b, 2003a, 2003b, 2004, 2005). The 2005 report claimed that 135 audits had been completed on E-rate applicants; of those, 48 were not in compliance with various E-rate program rules (FCC, 2005).

The E-rate program was also scrutinized by public media. In 2003, a news article (Borja & Trotter, 2003), claimed the E-rate program and applicants stood to lose millions of dollars because of multiple infractions and alleged criminal transgressions. The article reported that over 30,000 applicants had applied for E-rate funds each program year since 1997. Of the nearly 10 billion dollars of disbursed funding since 1997, some 26 cases were pending, which included applicants and service providers who were under indictment for defrauding millions of dollars from the program. Borja & Trotter's (2003) article stated that the FCC was trying desperately to overhaul its span of control over its administration of the E-rate program (Borja & Trotter, 2003). During an interview, Borja & Trotter (2003) quoted Mr. Tom Cline, the FCC audit director, who said (Borja & Trotter, 2003):

> We do have some serious concerns about this program…With our resources and the audit work we've been able to perform so far, which has been fairly fragmented and ad hoc, we can't state with any degree of assurance that this program is adequately protected against fraud, waste, and abuse. (p. 1)

During this early period of GAO and OIG inquiry, the FCC and USAC took many steps to increase the integrity of the program. The USAC Task Force developed a report

recommending corrective actions for the FCC's contemplation (USAC, 2003). In response to the Task Force, GAO, and OIG findings and recommendations from April 2003 through June 2005, the FCC placed several actions and rulemakings into place. Additionally, the FCC was drawing up plans to expand its capabilities to audit and monitor the E-rate program with the assistance of several government agencies including the U.S. Department of Justice (Borja & Trotter, 2003; Gilroy, 2001).

The FCC proceeds to create rules and policies (defined as rulemaking) as a response to enactments of Congressional law "affecting telecommunications…or when an outside party files a petition seeking a new law or change in existing rules" (FCC, 2017e, para. 1). In some cases, the FCC will issue a Notice of Proposed Rulemaking (NPRM) in an effort to inform and seek comment from the public on a proposed rule (FCC, 2017e). In response to inquiry and improvement, the FCC did both.

As previously mentioned, the FCC has made 161 major changes to the E-rate program. Some of these FCC directives represent better examples of E-rate policy and program change impact than others. The next section of this review will summarize the E-rate application process and will include several FCC rules and policies that initiated change and impact.

E-rate Application Process and Change

Although, E-rate has had a murky beginning, has fought to maintain its existence, and has continuously changed processes based upon Congressional and FCC policy, directives and recommendations, it has been successful in many cases over the years. The early study, *The E-rate in America: A Tale of Four Cities* reviewed the experiences and impacts the E-rate program had on school districts in four U.S. Cities (Carvin, 2000). The study clearly mentions that E-rate

is not without challenge, but the effort is worth it. Carvin explained one of several common themes (Carvin, 2000):

> The E-rate initiative has made it possible for these districts to create robust, high-quality networks that would never have been put in place without E-rate funding. The E-rate has had an especially high impact for several reasons: the funding it provides was not capped at a certain level; it requires intensive planning and implementation; and it encourages leveraging of multiple funding sources. Several district administrators said E-rate funding enabled them to make a quantum leap in their districts. (p. 16)

Despite scrutiny and hundreds of changes, the E-rate program has made an impact and has continued to provide billions of dollars in telecommunications discounts for two decades. However, it is necessary to understand how a multitude of processes work and how their history and current state might influence E-rate applicants. This information might inform applicants, stakeholders, education authorities, and policymakers how to better manage and derive benefit from the program. When reviewing the E-rate process, one could surmise that E-rate generally encompasses four primary activities: planning, applying, utilizing, and accountability (personal communication, January 1, 2017).

Planning. The E-rate planning process requires technology planning, which includes "past technology planning efforts; planning for E-rate funding; and plans for the future" (Carvin, 2000, p. 18). Many education professionals agree that student progress closely correlates to "assessment, information access, collaboration, and expression. Educational technologies have been shown to demonstrate particular promise in all four" (Dickard, 2002, p. 26). Technology in schools requires more than physically placing technology in schools. Leadership, professional development, sustained objectives, ample resources, perseverance, and evaluation are all important factors of effective technology planning (Dickard, 2002). E-rate is an available subsidy that can increase the school's chance of obtaining success.

Before one begins, however, they should review the description of the E-rate program and application flow chart (Figure 1). E-rate planning involves additional considerations:

1. Determining Needs Through Technology Planning
2. Determining Applicant Eligibility and Identification
3. Setup of an Organization Account in the E-rate Productivity Center (EPC)
4. Review of the Eligibility Service List (ESL) – See Appendix G

Determining needs through technology planning. Some confusion might still exist during the planning activity. *NPRM 2 – Modernizing the E-rate Program* removed the requirement for technology plans beginning in FY 2015 (FCC, 2014a). Prior to that, the FCC had issued its Sixth Report and Order in September 2010 (FCC, 2010a), removing the requirement for technology plans for applicants requesting Category One (Priority 1) services effective FY 2011. Before FY 2011, applicants were required to submit technology plans for all services except basic telephone service (USAC, 2016e). Although, a written and approved technology plan is no longer required, the implied task for administrators is to know the entity needs, which guide the application for services. NPRM 2 agreed with commenters and stated the following (FCC, 2014a):

> …we are certain though that, even absent this rule, technology planning will continue to occur because technology has become a central part of school and library infrastructure, and technology planning has become integrated into applicants' core strategic planning. We also expect that the structural changes we make to the E-rate program's approach to providing support for internal connections and basic maintenance of internal connections will encourage good planning. We strongly encourage all applicants, both large and small, to carefully review existing plans given the many changes to the E-rate program that we adopt in this Report and Order. However, we find that the burden of getting formal approval and certification of these technology plans outweighs the benefits to the program. (p. 79)

The Technology Plan was intended to be a living document, evaluated and updated throughout the E-rate funding year as applicants integrated technology needs. This evaluation

determined if applicants had met progress towards specified needs and goals, and if any corrections were necessary to take advantage of new technologies or to increase usage of a specific technology (USAC, 2016e). The technology plan could cover from one to three E-rate funding years. The technology plan had to be approved by an authorized Technology Plan Approver (TPA); this was normally a designated person(s) within each state education agency. In the case of BIE-funded schools, these entities could use the state education agency they resided in or seek assistance from the BIE for their approval (USAC, 2017ah).

Technology planning, whether mandatory or not, is essential to combine the bridge between how technology will support pedagogy, where people – educators, technology specialists, and other professionals – communicate goals and solutions for those goals, and how budgets are formed to support those needs (Barber, Taylor, & Buchanan, 2014; ISTE, 2000; Porter, 2004; Ritzhaupt, Liu, Dawson, & Barron, 2013). E-rate funding pays for only a percentage of certain eligible services. Each entity must determine how they will pay for the difference and how to integrate other non-E-rate devices and infrastructure into the plan.

In his dissertation, Vazquez-Cruz used informant data to discern four technology principles that facilitated progress: "technologies that facilitate research, technologies that facilitate communication, technologies that facilitate instruction, and technologies that facilitate student engagement" (Vazquez-Cruz, 2012, p. 112). Some of the principles that were not working so well were linked to technology infrastructure. One of his participants stated, "We have computer rooms but we don't have the cables that bring the internet to the computers" (Vazquez-Cruz, 2012, p. 130). Another emphasized having infrastructure, but no devices by stating, "we connected to the internet with wireless boxes that we purchased from Radio Shack; now the new wireless is here but the laptops are not" (Vazquez-Cruz, 2012, p. 131). One teacher

recalled an example: “she requested a science lesson from the local Education Service Center; the title was ‘whatever happened to Pluto’; the lesson was cancelled because it required local distance learning equipment that only existed at the administration building” (Vazquez-Cruz, 2012, p. 131).

Vazquez-Cruz’s examples demonstrate valid methods of uncovering weaknesses in the technology infrastructure of his school. Reviewing just the three pieces of data above, one could determine improvement is needed in the areas of broadband connectivity. Obvious solutions may imply a Wi-Fi network and using fiber and cable to expand the connectivity on the school campus. These examples also demonstrate legitimate ways to plan and apply those needs against the E-rate program ESL prior to applying for services.

Applicant eligibility and identification. Applicants must ensure they are eligible entities. Additionally, applicants must ensure they acquire certain demographic distinctiveness. First, they must get a Billed Entity Number (BEN) through the SLD (USAC, 2017l). The BEN is unique to one applicant; however, in the case of a parent entity applying for other subordinate entities, one BEN can be a primary applicant while another is a child entity. This commonly applies to entities applying as part of a consortium, or group of entities. For example, many BIE-funded schools apply for Internet bandwidth and filtering as subordinates to the BIE consortia. Creating a BEN requires a detailed information gathering, as Figure 2 suggests (USAC, 2017l).

To create an entity number, the following information should be on hand:
Entity's legal name
Physical address
Mailing address or PO Box, if different than physical address
County name
Telephone number
Organization type: independent school, school district, independent library, library system, consortium, child school entity, child library entity, NIF entity
If you are a school that is part of a school district or a library that is part of a library system, be prepared to provide the school district or library system entity number to link the school or library appropriately to its parent entity.
Organization sub-type(s): public, private, religious, Tribal, new construction, etc.
Email address for the EPC account administrator (must be an employee of the entity organization)
FCC Registration Number (for all entities that file program forms)
Schools: full/part time students, eligibility numbers for National School Lunch Program (NSLP) and Community Eligibility Program (CEP), State School Code and State LEA code
Libraries: square footage of library buildings receiving discounted service, note if they are the main branch in a library system

Figure 2. Creating billed entity numbers. Data in figure are adapted from "Entity Numbers," by Universal Service Administration Corporation (E-rate), 2017 (http://www.usac.org/sl/applicants/beforeyoubegin/entity-number.aspx). In the public domain.

Setup of an organization account in the e-rate productivity center. Effective FY 2015, all applicants must use the E-rate Productivity Center (EPC), an online portal that controls nearly every aspect of the E-rate process (USAC, 2015b). The EPC requires an account administrator that must be an employee of the entity; this administrator is responsible for setting up other user accounts and permissions and ensuring that the application process remains on schedule (USAC, 2017j). The EPC is a stand-alone information management system that comes with its own 4-page user access agreement (USAC, 2015a). The EPC allows access to "applicants, service providers, consultants, and United States government agencies excluding the Federal Communications Commission" (USAC, 2015a, p. 1).

EPC was energized by *NPRM 1 – Modernizing the E-rate Program* (FCC, 2013), which called for, amongst other things, a more effective and streamlined approach to E-rate administration procedures. This NPRM gathered so many comments that an additional directive, *NPRM 2 – Modernizing the E-rate Program*, was distributed a year later. NPRM 2 directed USAC "to make the E-rate application process and other E-rate processes fast, simple and efficient…modernizing USAC's information technology systems" (FCC, 2014a, p. 5). Both

documents received hundreds of comments requesting new processes that would ensure all correspondence and filing procedures should be handled electronically through the Internet (FCC, 2013, 2014a). This requirement would be phased in over the next several funding years and was considered a major improvement. The rationale was communicated as the following (FCC, 2014a):

> The efficiency of submitting and processing applications, resulting in faster commitments and disbursements of E-rate funding. Furthermore, electronic filing will reduce the program's administrative costs because USAC will not have manually entered data into its electronic system from paper submissions. Electronic filing will result in fewer errors on forms and other communications between USAC and applicants and service providers. Therefore, beginning in funding year 2017, we will require the submission of all filings and notifications electronically. (pp. 82-83)

Unfortunately, the EPC has not gone as planned and USAC was recently reprimanded by the FCC Chairman Ajit Pai, for failed administration of the new portal (Pai, 2016; Smith, 2017). Pai's rebuke was addressed to USAC CEO Chris Henderson, and announced, "the current state of affairs is unacceptable," primarily, calling attention to his disapproval of USAC's implementation of the new EPC (J. Smith, 2017, para. 1). Pai outlined USAC's previous claims the EPC would be fully functional to handle Funding Year 2016, but it was not. The invoicing system between service providers and applicants was still using old technology, and the planned budget for the program had risen steeply. The original budget plan of $19 million had risen to $30 million and many claimed that as much as $60 million would be needed to get EPC fully operative (Pai, 2016; J. Smith, 2017). Henderson resigned shortly after the criticism (Lestch, 2017). USAC continues to make improvements to the EPC, but still experiences shortcomings.

Review the eligibility service list (ESL). Generally, an E-rate applicant considers a service eligible unless it is "clearly marked not eligible" (Vazquez-Cruz, 2012, p. 35). During every funding year, the SLD releases the ESL before the primary filing window opens up

(USAC, 2017p). This list contains the "products that will be eligible for discounts, along with additional helpful information such as eligibility conditions for each category of service for each specified funding year" (USAC, 2017p, para. 1). Because the ESL has changed every year since 1998, it is important for applicants to review the ESL each year and plan accordingly. As a result of public comment, funding dilemmas, and policy, the ESL has undergone a few major overhauls. The Funding Year 2018 ESL is contained in Appendix G.

In October 2008, the 110th Congress released the Broadband Data Improvement Act (BDIA), directing the FCC to "issue its section 706(b) reports annually" (110th Congress, 2008, p. 1). A portion of the Telecommunications Act of 1996 is Section 706(b) – adoption of broadband technology, which requires, "advanced telecommunications capability" deployment to all Americans in a reasonable and timely fashion (FCC, 2017a, para. 1). Previously, the FCC was required to issue reports on broadband improvement only on a regular basis. Because of national interest and multiple surveys, Congress ordered the FCC to include an international comparison in its annual section 706 report (FCC, 2017b). One survey on multiple E-rate recipients, stirred congressional action. In this survey, "nearly half of respondents reported lower speed Internet connectivity than the average American home - despite having, on average, 200 times as many users" (FCC, 2015, para. 2).

President Obama also used this information to expand national broadband services. On June 6, 2013 President Obama's announced the ConnectEd Initiative, which essentially sought to enhance 99% of American students through high-speed wireless networks with minimum "broadband speeds of 100Mbps and with a target 1Gbps" (House, 2013, p. 2). ConnectEd ordered the FCC to assist with this modernization through partnership with the National Telecommunications and Information Administration (NTIA) and the FCC E-rate program

(USAC, 2017m). The foreseeable focus was on "expanding WiFi-networks in schools and libraries across America while ensuring support continues to be available for broadband connectivity to schools and libraries" (FCC, 2015, para. 3).

Most recently, the FCC's Wireline Competition Bureau (WCB) released the previously mentioned NPRM 1 and NPRM 2, which sought focused comment on an ongoing policy called E-rate Modernization. The result of NPRM 1 and NPRM 2 is what many people in the E-rate community refer to as E-rate 2.0. One of the primary goals of NPRM 2 is the need for E-rate to evolve so that it can provide broadband capable of delivering "bandwidth-intensive digital learning technologies" (FCC, 2014a, p. 3). A continuing goal is to provide eligible E-rate services while boosting cost efficiency. The third goal of this NPRM is to provide fast and efficient information technology service, resulting in the EPC mentioned above.

NPRM 2 streamlined the ESL and funding in several ways. First, in order to facilitate the national access to broadband, USAC was ordered to phase down eligible voice services from 2014 through 2019. By the end of that time, discounts for land line and cellular phone services will no longer be available for E-rate applicants. "Demand for Priority I services in funding year 2014 was $2.63 billion," (FCC, 2014a, p. 30). The FCC determined that removing voice services would save the program approximately $860 million which could instead be applied to broadband support (FCC, 2014a).

The plan also called for an increase in the funding cap to $3.9 billion, significantly over the previous cap of $2.5 billion. Of that $3.9 billion, a cap of $1 billion would be apportioned to Category Two services that support the delivery of broadband to and through the applicants' network. The old Category Two requirements allowed an applicant to install broadband

equipment (internal connections) within their facility twice out of every five funding years (USAC, 2017p).

NPRM 2 requires the applicant to budget for Category Two services by linking their total student enrollment to a dollar amount of $150.00 per student for a 5-year period commencing the first year they use Category Two funding. NPRM 2 also lowered the maximum discount for Category Two services to from 90 to 85 percent. Rules also set a funding floor for small entities of $9,200 per site over a five-year period (FCC, 2014a). The FCC also directed the Wireline Competition Bureau (WCB) "to monitor this new five-year budget approach and report on its sufficiency and effectiveness" (FCC, 2019, p. 2).

The most recent WCB report was published in February 2019 and it recommended that the Commission "retain the category two budget approach and avoid a return to the prior so-called two-in-five rules'" (FCC, 2019, p. 2). This report concludes a higher more diversified participant rate of applicants received equal funding, explaining "the data as showing clear improvements in the way in which funding for internal connections has been administered since Funding Year (FY) 2015 and is supported by the Public Notice comments" (FCC, 2019, p. 2).

The original demise of the Two-in-Five rule can be summarized as:

> …approach proved to be ineffective for ensuring broad, equitable, and predictable access to funding for internal connections. In most years, the E-rate program could still only provide support for internal connections to applicants with the highest discount rates, which were disproportionately urban schools. From FY2010 to FY2014, applicants below the 89% discount rate received funding only once, in FY2010. In FY2013 and FY2014, no funding was available for category two services. Further, applicants had little certainty that funding for internal connections would be available. (FCC, 2019, p. 2)

This study will investigate the impact of the Category Two funding change, with a preliminary expectation that the change will prove grievous for highly impoverished schools. Hundreds of thousands of dollars are needed to install fiber, cable, switches, wi-fi, and other

ancillary equipment necessary to facilitate a school's network. Even if a school had previously installed such a network using old E-rate program rules, eventually, that equipment will wear out and need replacement. With the current budget constraints, a school of 200 students would only be able to receive $30,000 dollars in eligible Category Two discounts over a 5-year period.

Applying. The application process mimics a full procurement cycle. The entity making the request can be a single school or a group of schools in a consortium application. Applying for E-rate involves the following steps (USAC, 2016b, 2017q):

1. Competitive Bidding Process
2. Selecting Services Providers
3. Applying for Discounts
4. Application Review

Competitive bidding process. The initial request for services is created with the *Description of Services Requested and Certification* (USAC, 2017n) Form 470 (FCC Form 470) which is completed and entered into the EPC (USAC, 2017j). In times past, this form could be filled out by hand and mailed or faxed.

The FCC Form 470 provides information about the entity or consortium making the request and the goods or services required. The FCC Form 470 must be posted for at least 28 days, a period of time referred to as a competitive bidding cycle (USAC, 2017t). Eligible service providers within the EPC system will be able to view a request for services and compete by submitting bids to the applicant. In some cases, an applicant may have contracted existing services (through E-rate) for an extended period; therefore, applicants are not required to submit additional requests for these services. However, in the case of month-to-month services without a contract and new services requiring a contract, a new FCC Form 470 request is required each

year (USAC, 2017x). Occasionally, larger service requests require detailed information. In these cases, applicants have the option to issue a Request for Proposal (RFP) document that must be uploaded into the EPC along with the FCC Form 470 (USAC, 2017t).

The FCC Form 470 can be filed once for every service category or multiple forms can be filed for each category of service. For instance, a school is on a consortium application for internet services, and they file another FCC Form 470 for internal connections.
An applicant can also file one FCC Form 470 for Category One Services, and another for Category Two Services. However, an entity cannot apply for like services with different applications or be a member of a consortium application asking for the same type of service being requested on another FCC Form 470 from the applicant (USAC, 2017k). This is called duplication of services, and it violates program rules. Therefore, it is critical for entities to know if they are part of a larger consortia.

Competitive bidding must be open and fair; complete separation from vendors is key in this process (USAC, 2017g). The E-rate applicant must be prepared to accept and evaluate all bids when they certify the FCC Form 470. Only the applicant and associated staff can evaluate the proposals. The FCC Form 470 process must never be associated with any service providers, nor should a relationship exist with potential service providers (USAC, 2017g). As per USAC's guidance (USAC, 2017g):

> The competitive bidding process must be open and fair. "Open" means there are no secrets in the process – such as information shared with one bidder but not with others – and that all bidders know what is required of them. "Fair" means that all bidders are treated the same and that no bidder has advance knowledge of the project information. (para. 6)

When adding Category Two services into the EPC, applicants must never list requested items by manufacture and model number (USAC, 2017k). This violates the competitive nature

of the E-rate process. Applicants must list these items as "or equivalent" along with the manufacture. For instance (Figure 3), "24-port, power over Ethernet switch, CISCO "or equivalent."

Several schools were denied funding for hundreds of thousands of dollars of eligible service requests because they listed their needs by exact make and model. They failed to adhere to the instructions and violated competitive bidding requirements (personal communication, December 21, 2010). They were forced to wait another program year before they could reapply. An example involved a BIE-funded school attempting to place specific equipment in their school using the E-rate program because the BIA had a preferred technology infrastructure (BIA, 2007) called the Common Operating Environment (COE). BIE schools operating on the COE experience many benefits, such as free licensing for their Microsoft Office, Anti-Virus and computer operating systems (BIE, 2008). In addition, they receive certain technology support through the BIA technical teams for free.

Entity Number:	**Applicant's Form Identifier: 2013BS**
Contact Person:	**Phone Number:**

10 Internal Connections Other Than Basic Maintenance

If you check YES to indicate you have a Request for Proposals (RFP) that specifies the services you are seeking, your RFP must be availa 28 days. If your RFP is not available to all interested bidders, or if you check NO and you have or intend to have an RFP, you risk denial of

a ☐ YES, I have released or intend to release an RFP for these services. It is available or will become available on the Internet at:

or via (check one) ☐ the contact person in Item 6 or ☐ the contact person listed in Item 12

Your RFP Indentifier:

b ☑ NO, I have not released and do not intend to release an RFP for these services.

Whether you check YES or NO, you must list below the Internal Connections services you seek. Specify each service (e.g., a router,hub and (e.g., connecting 1 classroom of 30 students).

Example - "Or Equivalent"

Service	**Quantity and/or Capacity**
1 x 24 port switch (stackable) - 10/100/1000 PoE Switch - Cisco or equivalent	1 for Middle School IDF network expan
1 x 48 port switch (stackable) - 10/100/1000 PoE Switch - Cisco or equivalent	1 for main server room MDF network e computer/lab
Battery Backups and ancillary equipment necessary to support new switches	Form Middle School and Main Server F
50 cat 6 data drops(single,dual and quads), in various bld classrooms and offices and for wireless-plenum, Include ancillary equipment necessary.	50 x Drops Support Network expansion Middle School and one in main building

Figure 3. Example FCC Form 470 – Category two request. This is a portion of an FCC form 470 from funding year 2013 from School "A." It demonstrates how applicants should use the "or equivalent" entry when attempting to get bids for a specific manufacturer's item. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

This instance of listing the needs by "make and model" was caused by conditions established in a BIE technology grant. During the 2009-2010 School Year, the BIE received grant funding from the Department of Education for Enhancing Education Through Technology (EETT). Under EETT, "the U.S. Department of Education provides grants to State educational agencies (SEAs) on the basis of their proportionate share of funding under Part A of Title I" (USDOE, 2017a, para. 1). In order to compete for the grant, BIE schools were required to agree to become members of the BIE COE and sign an agreement to be placed on the Education Network for Native Americans (ENAN). The ENAN placed these schools on the BIE Network Domain and connected them to Internet protective filtering in accordance with the Child Internet Protection Act (CIPA).

This whole scenario resulted in the school applying for the grant and applying for E-rate simultaneously. When they applied for E-rate, they tried to ensure they asked for the correct equipment needed to support the COE. In doing so, they failed to review the "or equivalent" rule for the FCC Form 470. Their application was submitted; they chose a service provider; and they submitted the follow-on application, FCC Form 471. The mistake was caught during program review, but it was too late to correct it – the service provider was already chosen, and others were not considered because they did not offer the specific equipment requested. The entire Category Two application was denied. The applicant, the State Education Agency (BIE), and the BIA all learned many lessons from this incident.

This example demonstrates several layers of confusion evolving from a misunderstanding of the *Conducting an Open and Fair Bidding Process* (USAC, 2017g). First, the SEA set conditions on what equipment must be installed in the school because they were not fully aware of the E-rate program's open and fair bidding process. Second, the schools involved were

simply following directions from their SEA in order to capitalize on additional funding through the EETT grant. Third, the SLD did a poor job in identifying the "or equivalent" rule on their website and on the FCC Form 470 instructions. The only mention found on the SLD website states (USAC, 2017g):

> The FCC Form 470, RFP, or other solicitation method should be clear about the products, services, and quantities the applicant is seeking and must be based directly on the applicant's technology needs…Generic or encyclopedic requests will inhibit service providers from composing a responsive bid without additional information or insight into the applicant's bid solicitation.
>
> - Examples of a generic FCC Form 470 or service description include "all eligible services," "any E-rate Program products," or "all telecom services."
> - Examples of an "encyclopedic" service description are replications of the entire Eligible Services List or a "grocery" list of services that does not cover a specific service or product (para. 5).

Most applicants would read the above information and interpret the need to include detailed information that covers products and services used for a specific purpose. There were several newsletters posted in 2015 and 2016 that specified, "applicants cannot include the name of a specific manufacturer, brand, product, or service on an FCC Form 470 or RFP unless they also use the words 'or equivalent" in their description of the products and services desired"(USAC, 2015c, para. 9). However, the SLD could have easily placed the "or equivalent" explanation with the FCC Form 470 application and instructions as a definitive warning to eliminate any misunderstanding.

In this case, the chain of command failed to realize the impact their directives might have on the E-rate process, nor were the higher agencies even fully aware of the detailed E-rate program rules. The EPC now has a functional drop-down box that contains the "or equivalent" notice and goes on to explain "applicants must then carefully consider all bids received, including any equivalent offerings, before choosing the most cost effective bid" (USAC, 2015c, para. 9).

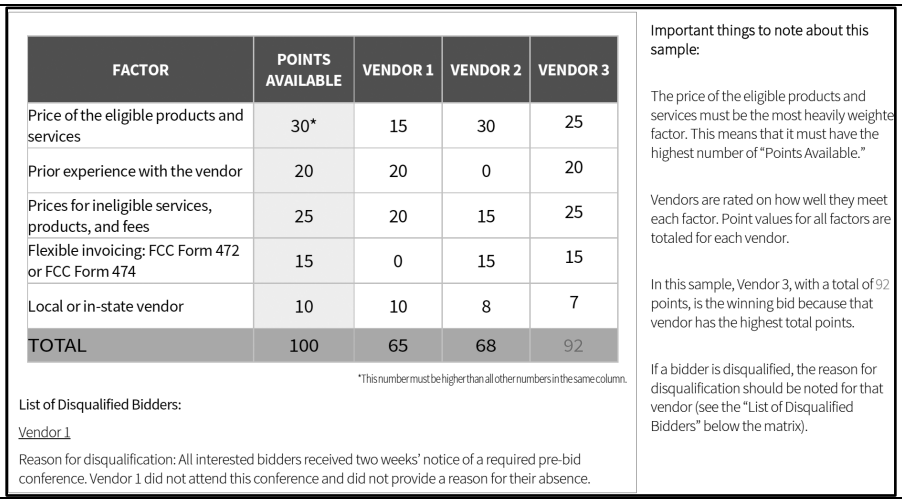
Consortium applications exist when a group of "like" eligible entities join to undertake a project or goal using E-rate discounts. The reasons can vary: a school district manages the bandwidth in all schools; the state education agency has a state contract to provide schools a particular eligible service for a reduce rate; resources are limited for a single entity (USAC, 2017e).

Consortium applications require detailed planning, agreement and awareness of all parties are involved. Consortium members must fill out and sign a Letter of Agency (LOA) agreeing to belong to the consortium and allowing the parent entity to perform all E-rate processes for the funding request (USAC, 2017u). The lead person of the consortium must be authorized to act on behalf of the lead agency and the subordinate agency must agree to this. The LOA must be signed and filed prior to the submittal of the FCC Form 471. Normal, LOA activities take place during the planning phases and everyone is aware and in agreement prior to the filing of the FCC Form 470.

Consortium application procedures must be strictly adhered to, as information dissemination to subordinate agencies is critical. For example, the BIE receives the majority of their information technology support from the Bureau of Indian Affairs, making the BIA the lead agency for the Internet Bandwidth contract for nearly 100 BIE-funded schools in the United States (BIA, 2007). During the early years, the BIA failed to properly document competitive bidding procedures in the annual consortium application for bandwidth; as a result, it took nearly six years (until FY 2011) to successfully negotiate the consortia process (personal communication, January 1, 2017). As a result, the BIA and the BIE had to absorb this multi-million-dollar expense, reducing the amount of monies available for non-E-rate eligible services. Once a new RFP was released, a proper bid evaluation process and contracting procedure were

documented. The application currently provides millions of dollars each year to needy BIE schools. The original fault was due to competitive bidding and contracting processes that were not documented in accordance with E-rate program policy. Old decision-makers had moved on, and new management was left with an undocumented process.

Selecting service providers. After the competitive bidding cycle ends, applicants evaluate proposals and choose a service provider for the request (USAC, 2017t). USAC provides an example for the bid evaluation matrix (Figure 4). Applicants can consider a multitude of factors in their evaluation as long as price is weighted more heavily than any other single factor (USAC, 2017r, 2017x). Periodically, applicants only receive one bid for their request. In these cases, applicants must still evaluate the request to ensure it is cost effective; normally, this is done through national average comparison. If no bids are received, applicants are forced to solicit bids by contacting local service providers. In both cases, applicants are required to document these facts in a memorandum or email for their records (USAC, 2017x). Once a service provider's proposal is accepted, applicants must agree and sign a contract formalizing an agreement prior to submitting the FCC Form 471 (USAC, 2017y).



FACTOR	POINTS AVAILABLE	VENDOR 1	VENDOR 2	VENDOR 3
Price of the eligible products and services	30*	15	30	25
Prior experience with the vendor	20	20	0	20
Prices for ineligible services, products, and fees	25	20	15	25
Flexible invoicing: FCC Form 472 or FCC Form 474	15	0	15	15
Local or in-state vendor	10	10	8	7
TOTAL	100	65	68	92

*This number must be higher than all other numbers in the same column.

List of Disqualified Bidders:

Vendor 1

Reason for disqualification: All interested bidders received two weeks' notice of a required pre-bid conference. Vendor 1 did not attend this conference and did not provide a reason for their absence.

Important things to note about this sample:

The price of the eligible products and services must be the most heavily weighted factor. This means that it must have the highest number of "Points Available."

Vendors are rated on how well they meet each factor. Point values for all factors are totaled for each vendor.

In this sample, Vendor 3, with a total of 92 points, is the winning bid because that vendor has the highest total points.

If a bidder is disqualified, the reason for disqualification should be noted for that vendor (see the "List of Disqualified Bidders" below the matrix).

Figure 4. Sample bid evaluation matrix From "Sample Bid Evaluation Matrix," by the Universal Service Administrative Company, 2017 (https://www.usac.org/wp-content/uploads/e-rate/documents/samples/Bid-Evaluation-Matrix.pdf). Copyright [2017] by Universal Service Administrative Company. Reprinted with permission.

Applying for discounts. The next step is to complete the *Service Ordered and Certification* FCC Form 471 (USAC, 2017z). The FCC Form 471 creates the orders for the goods and services for each entity and is linked to the service provider(s) selected for the funding requests. Other information includes the "discount calculations, costs of service, dates of service, and detailed descriptions of services; as well as and certification compliance with program rules" (USAC, 2017ac, para. 1). Applying for discounts consists of several important steps, which are often not in any order.

1. Understanding the filing window
2. FCC Form 471 filing
3. Calculating discounts and urban/rural status
4. Category Two budget

Understanding the filing window. The FCC Form 471 has a specified filing window each year. During the initial implementation of E-rate in 1998, the FCC announced the program was essentially on a first-come, first-serve basis. However, after consideration, the FCC announced it would establish a 75-day filing window to accommodate disparity between applicants with and without ample resources to file during the initial announcement (England-Joseph et al., 1998). As a result, an annual filing window has become the norm for the E-rate program to accommodate fairness and dissemination of program information flow. Although, there has been limited predictability with filing windows since 1998. *Funds For Learning*®, a professional firm specializing in the federal E-rate funding program, provides a visual example in Figure 5.

Figure 5 depicts a cycle of change over the years; some credit this to policy change and funding cap decisions made on an annual basis (Dempsey, 2008). The extra-long filing window

in 2016 and its extension resulted in EPC shortcomings during the first year of its implementation (Harrington, 2017).

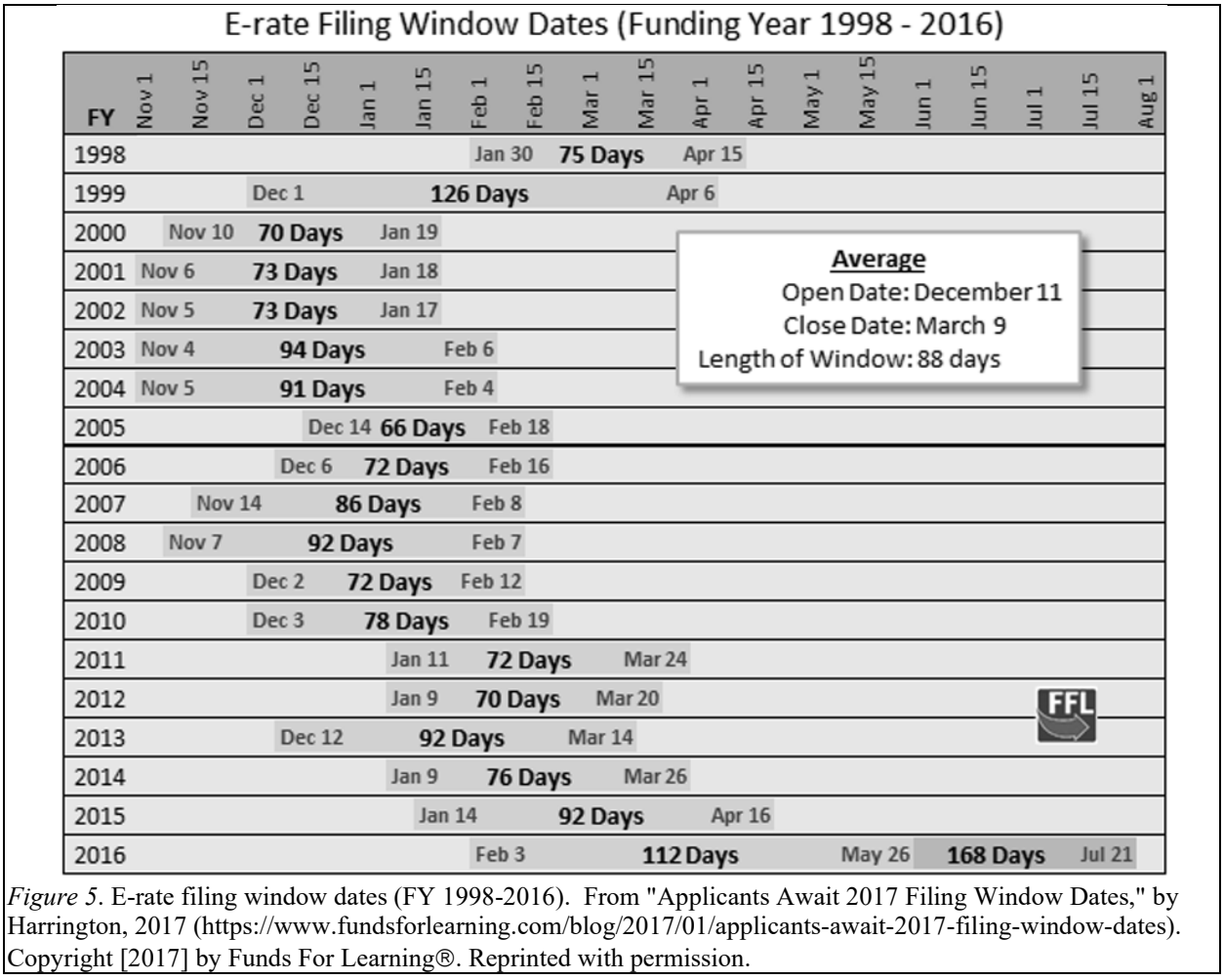


Figure 5. E-rate filing window dates (FY 1998-2016). From "Applicants Await 2017 Filing Window Dates," by Harrington, 2017 (https://www.fundsforlearning.com/blog/2017/01/applicants-await-2017-filing-window-dates). Copyright [2017] by Funds For Learning®. Reprinted with permission.

Funding begins the first day of July each year, and the filing window normally opens approximately six months before the start of the funding year (USAC, 2017z). However, applicants normally find that they can file the Form 470 much earlier than the opening of the window. The last day of the filing window defines the deadline to file the FCC Form 471, indicating, an applicant must file the FCC Form 470 far enough in advance to give 28 days for the competitive bidding window (USAC, 2017z). Applicants that fail to file before the last day of the window can submit a waiver addressed to the FCC requesting an exception. Waivers

within reason – usually, 14 days late or less – are normally approved (FCC, 2010b) due to an earlier FCC order and precedence.

FCC Form 471 filing. The FCC Form 471 application includes steps for uploading funding request documents pertinent for each funding request. Prior to the opening of the EPC, this action was referred to as the Item 21 (USAC, 2016g). The Item 21, now called Bulk Upload Line Item and Recipient of Service (ROS), is a verification to show proof of costs, such as service provider bills, contracts, or historical data. The ROS allows applicants to upload entire contracts and to break down items such as phone bills into an excel spreadsheet to itemize eligible and ineligible portions of a phone bill (USAC, 2016b). Other portions of the FCC Form 471 break out specific cost estimates and entity demographics such as proven impoverishment rates, budget information, National Center for Education Statistics (NCES), and FCC Registration numbers (USAC, 2017aa).

Applicants request services individually on the FCC Form 471. Each request is referred to as a Funding Request Number (FRN) (USAC, 2017ad). Each FRN must contain key information and products and services requested. Applicants need to have all this information compiled prior to filling in the data. If they do not, the EPC filing process will not let them continue to subsequent steps. Key information consists of (USAC, 2017ad):

- Service Type
- Establishing FCC Form 470 (if applicable)
- FCC Form 470 exemption reason (if applicable)
- Service provider name and Service Provider Identification Number (SPIN)
- Billing account number (optional)
- Type of service agreement: tariff, month-to-month, or contract
- Service start and end dates
- Narrative: a brief explanation of the products and services requested (para. 1)

Products and services requested include the Funding Request Number (FRN) line item detail and cost associated with the eligible and ineligible products and services requested including (USAC, 2017ad):

- Service type
- Product type
- Purpose
- Quantity
- Bandwidth upload and download speeds
- Type of connection
- Make/model (for Internal Connections requests)
- Lease or non-purchase agreement (for Internal Connections requests)
- Eligible and ineligible monthly and one-time costs
- Note: Applicants can receive assistance from service providers when compiling data for the funding request section of the form (para. 2)

Calculating discounts and urban/rural status. The FCC Form 471 has a section used for entering discount calculation information. This is linked to the entity or entities (in case of consortium) that will be filing for discounts. As entity information is entered into the EPC, calculated discounts are figured automatically by the portal (USAC, 2017ab). Though several entity types exist, the common entities are School District, Individual School, Consortium or Statewide Application of Schools and/or Libraries, and Non-Instructional Facilities (NIF). Because this study is limited to schools, Library specifics will not be reviewed. The primary method of calculating discounts is to first determine both the percentage of students eligible for the National School Lunch Program (NSLP), and the urban/rural status of the entity(s). The applicant then uses the Discount Matrix (Figure 6) to determine the level of discount (USAC, 2017ab).

To follow FCC Form 471 protocol, a school district would determine the total number of students eligible for NSLP in the whole district. The school district would then determine the total number of students in the entire district. The final step is to divide the number of NSLP

students by the total enrolled number. Individual schools that have their own school board and independent financial system use the same technique as a school district.

Consortium or Statewide Application entities add every member to the application and calculate discounts by adding the individual discount of each member and dividing by the total numbers of members in the application. These applications do not contain an urban or rural status, but receive a "simple average of the member discounts, whether each individual member has an urban or rural status" (USAC, 2017ab, para. 6). When the application is for Category Two discounts, the percentages used must be the Category Two discounts for each member, and must not exceed 85%, because this is the maximum discount now available for Category Two Discounts (USAC, 2017ab).

Many schools and school districts have one or more non-instructional facilities (NIF). A NIF "is a school building without classrooms or a library building without public areas. Non-instructional facilities on school and library property are eligible to receive discounts on data transmission services, internet access services, and voice services (Category One services)" (USAC, 2017af, para. 1). NIFs might be administrative buildings, bus garages, or offices. NIFs are not eligible for Category Two services unless it is proven that they are essential to the delivery of information to an instructional portion of the entity. In the past, supporting NIFs with E-rate funding was highly contentious and usually resulted in program integrity reviews and even audits. After NPRM 2, the most cost effective practice is to include NIFs within coverage of the wi-fi plan (FCC, 2014a).

As mentioned, after determining the NSLP percentage, applicants determine the urban/rural status of the entity(s) and use the Discount Matrix to determine the level of discount. As outlined in NPRM 2, beginning in FY2015 (USAC, 2017ae):

> An individual school and library will be designated as "urban" if located in an "Urbanized Area" or "Urban Cluster" with a population of 25,000 or more as determined by the U.S. Census Bureau. Any school or library not designated "urban" will be designated as "rural" and would be eligible to receive an additional discount. (para. 1)

However, if a rural school is part of a school district application that is classified as urban, the rural school must classify itself as urban. If more than 50% of the schools in a district are considered urban, the entire district must apply for the urban discount, and the same applies if the majority of schools are considered rural (USAC, 2017ae). Schools in a consortium or statewide application determine their NSLP, urban/rural status, and discount percentage prior to submitting that information to the lead agency. The actual lead entity on the consortium or statewide application does not use an urban or rural status. After determining the urban/rural status, applicants must use the Discount Matrix (Figure 6) to determine their actual discount percentage.

INCOME Measured by % of students eligible for the National School Lunch Program (NSLP)	CATEGORY ONE		CATEGORY TWO	
	URBAN Discount	RURAL Discount	URBAN Discount	RURAL Discount
Less than 1%	20%	25%	20%	25%
1% to 19%	40%	50%	40%	50%
20% to 34%	50%	60%	50%	60%
35% to 49%	60%	70%	60%	70%
50% to 74%	80%	80%	80%	80%
75% to 100%	90%	90%	85%	85%

Figure 6. Current E-rate discount matrix. From "Discount Matrix," by the Universal Service Administrative Company, 2017 (https://www.usac.org/wp-content/uploads/e-rate/documents/samples/Discount-Matrix.pdf). Copyright [2017] by Universal Service Administrative Company. Reprinted with permission.

Consortium and statewide applications do not use the Discount Matrix, but calculate the actual average of all participants, and results are rounded to the nearest whole number.

Applicants are therefore instructed to "round down to the nearest whole number for decimals less than 0.5 and round up for decimals equal to or greater than 0.5" (USAC, 2017ab, para. 5). For instance, 74.4 becomes 74 and 62.5 becomes 63.

Although periodically argued against, NSLP eligibility has been used as the primary method in determining discounts since the inception of E-rate. Dickard's study asked, for example, whether the use of the school free and reduced lunch percentages was the best methodology to determine an applicants' level of impoverishment. He recalled that the Bush administration recommended that high-cost areas should be largely targeted for E-rate funding rather than using NSLP percentages. (Dickard, 2002). Since one of the targeted areas for E-rate was remote and rural areas, the participants in his study assumed applicants in remote and rural areas would probably be in a high-cost area. Another study explained that early policy discussion suggested using an index "based on the number of students in a school district who qualify for Title I funds" (Carvin, 2000, p. 13).

As a result of Moderation Order, NPRM 2 (FCC, 2014a) discount calculation techniques were revamped as part of the E-rate efficiency ambition during that order. School districts are now allowed to calculate "district-wide" discounts rates per applications, instead of trying to determine rates solely from schools in that district that were receiving services. Prior to NPRM 2, districts were required to determine discounts per school, or what was known as "building-by-building discount rates" (FCC, 2014a, p. 84). Even if certain buildings or schools within the district did not need eligible services, they were still included. Districts often filed separate FCC Forms 471 to account for varying discount levels for different schools or NIFs. The latest district approach eliminates previous methods that misled both applicants and the SLD on calculations required for adding a NIF to the funding request. The earlier method required

applicants to determine how many hours per week a NIF might was used as a classroom. Thus, this information was cost-allocated by the percentage of non-instructional time used versus time spent providing instruction.

Application review. Upon receipt of the FCC Form 471, the SLD will begin a review process to ensure program integrity (USAC, 2017ag). "All applications go through an initial review and a final review," (USAC, 2017ag, p. 1) which might result in formal inquiry from reviewers. The SLD Program Integrity Assurance (PIA) process consists of informal and formal vetting to ensure compliance with program rules. An example of an informal review is a simple vetting of application documentation without contact with the applicant. A formal review requires contact with the applicant and can consist of a selective review, cost effectiveness review, or gathering of other information on the applicant. PIA reviews can focus on entity eligibility, eligibility of services, calculation of discounts, competitive bidding, or other administrative questions. It is not uncommon for reviews to investigate previous funding years, especially of an applicant who has already shown a history of concern.

Applicants only have 15 days to respond to review inquiries. In the past, reviews were mailed, faxed, and emailed to the primary point of contact on the FCC Form 471 application. Currently, everything is disseminated through the EPC. It is important for applicants to be aware of the review period and ensure they are available to receive and answer reviews. If an extension is needed to answer a review, the applicant can request this, and it is normally approved. However, failure to answer a review can result in denial of all funding associated with the application in question (USAC, 2017ag).

It is important for more than one person to be involved in the E-rate process. If the point of contact leaves the employment of the entity and no one is added as the point of contact in their

place, the SLD will be unaware. As a result, all correspondence for the application in question will be sent to the original point of contact and may never be received by the applicant. This will result in several follow-up contact attempts by the SLD, but it often results in denial of funding. To ensure continuity through the duration of the process, proper oversight of this program is crucial.

Utilizing. Once the Form 471 has been reviewed, the SLD issues the applicant funding decisions for each FRN on the application. The notification comes in the form of a Funding Commitment Decision Letter (USAC, 2017ag), also known as (FCDL). Before NPRM 2, applicants received their FCDL through the mail; with EPC, applicants will find their FCDL notification in the "News Feed" section of their EPC account (USAC, 2017ag). FCDL notifications go to the applicant and service provider for the decision on each FRN. If an applicant believes any funding requests have been incorrectly reduced or denied, the applicant can submit an appeal to USAC within 60 days of receiving their FCDL (USAC, 2017b). Appeals must be typed using an approved format available from the Appeals and Audit page on the SLD website. Appeals can be filed from within the EPC or emailed. Applicants requesting waivers of FCC rules "(i.e. late payment fees, waiver of form deadlines, etc.) should file an appeal directly with the FCC because USAC cannot waive FCC rules" (USAC, 2017b, para. 2). Utilizing funding consists of two steps:

1. Starting Services – FCC Form 486
2. Invoicing

Starting services – FCC Form 486. Following a "positive funded" FCDL, the applicants are then required to file their *Receipt of Service Confirmation and Children's Internet Protection Act and Technology Plan Certification* FCC Form 486 (USAC, 2017ah). The "FCC

Form 486 must be received or postmarked no later than 120 days after the Service Start Date shown on the FCC Form 486 or 120 days after the date of the FCDL, whichever is later" (USAC, 2017ah, para. 4). The FCC Form 486 notifies USAC that services have started for one or more FRNs and that certain Child Internet Protection Act (CIPA) and Technology Plan compliancy requirements are adhered to during this process (USAC, 2017ah). Technology Plan requirements would apply for Funding Year (FY) 2014 and previous year applications or state agency requirements.

Applicants filing their FCC Form 486 after the deadline will have their services start date moved "to the date 120 days before the FCC Form 486 was received or postmarked" (USAC, 2017ah, para. 7). For instance, filing the FCC Form 160 days after the FCDL was issued, USAC will cost allocate the funding by subtracting 40 days from the total commitment. The following is an example of the costs of filing late:

An applicant with a 90% eligible discount has an annual cost of $60,000 dollars for 100Mbs of Internet bandwidth and filtering. They file for E-rate discounts and USAC issues them an FCDL committing to a 90% discount of $60,000 dollars (60,000 x .90) or $54,000 dollars. The applicant files their FCC Form 486 forty days late and USAC cost allocates 40 days from 365 days (40 / 365) at approximately 10.95% of the committed value of $54,000 dollars. As a result, USAC reduces the funding commitment by a little over $5,400 dollars. USAC will issue one reminder to applicants missing their deadline date for FCC Form 486 filing, and this reminder gives them a 15-day grace period to file. However, it is up to the applicant to pay attention to the deadlines and to file on time (USAC, 2017ah).

Invoicing. Utilizing also includes the process of invoicing the SLD for the discount share of the approved eligible services. Invoicing either involves the applicant seeking reimbursement for payments made prior to receipt of funding, or the service provider invoicing the SLD. Once the service provider and applicant decide on which method will be used, the process cannot change for that particular funding request (USAC, 2017ak).

If the applicant elects to initiate invoicing, they file FCC Form 472, the *Billed Entity Applicant Reimbursement* (BEAR) Form (USAC, 2017ak). This would be the case if the applicant has paid the service provider in full for a service request, requiring that they seek reimbursement for their eligible discounted portion awarded by USAC. USAC receives the FCC Form 472 and verifies it for accuracy, approving payment directly to the applicant if everything is satisfactory. The FCC Form 472 cannot be filed using the EPC portal. Applicants must file this form using the older online system used for all online applications prior to EPC implementation. However, applicants must initiate other specifics within their EPC portal in order to file the FCC Form 472 (USAC, 2017ak). Applicants must also include an electronic PIN number, which is a unique PIN associated with the older online filing process. Applicants who maintain an older PIN can use that one, or they can request one from the Client Service Bureau (CSB) at (888) 203-8100. Another irregularity with this process is that a PIN is specific to the account name of a user linked to a billed entity number (BEN). Thus, if a person files for more than one billed entity, they must have a PIN for each (USAC, 2017aj). If the original point of contact for the entity is gone, the new point of contact will have to obtain a new PIN.

NPRM 2 altered the method of reimbursement so it goes directly to the applicant (FCC, 2014a). Previous applications required reimbursements to be paid to the service provider, in which case the service provider was responsible for reimbursing the applicant with 20 business

days. NPRM 2 determined that this process often caused contention and delay in reimbursement, so the process was simplified. Another change is that an FCC Form 498 must be filed by the applicant to verify their identification and to link their entity directly to their bank account so payments can be deposited electronically. Applicants use the EPC to the file FCC Form 498, and they may have separate 498 Identifications for each bank account associated with their entity (USAC, 2017ai).

E-rate program rules allow applicants to initiate services after they file the FCC Form 471, but before they receive funding for the FRN. This is often the case when an applicant requires the service to be in place to facilitate important information technology projects. For instance, if the applicant were to seek discounts for a Wireless Network costing $10,000 dollars and their level of impoverishment was 100%, they would be allowed a discount of 85% (USAC, 2017h) in accordance with the Discount Matrix for Category Two services. The applicant decides to get the Wireless Network installed prior to receipt of funding because they need it immediately. The applicant would pay the service provider selected on the FCC Form 472 for the entire amount ($10,000 dollars) and begin the project knowing there is a chance that funding could be denied or reduced. Once the applicant is funded, they would file FCC Form 472 to seek reimbursement of their discounted portion – in this case, 85%, or $8,500 dollars.

If the applicant chooses to wait until they receive funding, the service provider invoices the applicant for their share of the eligible services (in the above example, $1,500 dollars). The service provider also invoices the SLD using the *Service Provider Invoice (SPI)* FCC Form 474 for the discounted portion ($8,500 dollars) of the project (USAC, 2017ak). USAC receives the FCC Form 474 and verifies it for accuracy, approving payment directly to the service provider if

everything is satisfactory. The applicant must have paid for their non-discount share of the service before USAC will reimburse the service provider.

Accountability. Within the E-rate application process, there are various procedures to assist with accountability of the program. Several of the more common methods involve document retention, acknowledgement, the ability to correct, changing or extending processes, and service delivery.

Document retention. Document retention is explained as (USAC, 2017i):

> All applicants and service providers are required to retain receipt and delivery records relating to pre-bidding, bidding, contracts, application process, invoices, provision of services, and other matters relating to the administration of universal service for a period of at least ten years after the latter of the last day of the applicable funding year or the service delivery deadline for the funding request. (para. 1)

After November 20, 2014, the Federal Register announced modifications to change the previous rule of maintaining records for five years to ten years (USAC, 2017i).

Acknowledgment. Each step in the application process involves some form of applicant certification followed by an acknowledgment from the SLD that they received an FCC Form and that the applicant can make certain changes or corrections.

FCC Form 470 acknowledgement is communicated when USAC issues "an FCC Form 470 Receipt Notification Letter (RNL) to the applicant in the E-rate Productivity Center (EPC) upon successful data entry of an FCC Form 470" (USAC, 2017w, para. 5). Once the RNL notification is received, applicants can make four changes to the FCC Form 470 (USAC, 2017v, para. 3):

1. Edit the application nickname.
2. Add one or more FCC Form 470 RFP documents.
3. Change the main contact person.
4. Edit the technical contact person on the FCC Form 470.

If major changes are required, such as adding new service requests, the applicant must initiate a new FCC Form 470 initiating a new 28-day competitive bidding cycle. The new FCC Form 470 is also subject to the application window; thus, filing an FCC Form 470 fewer than 28 days prior to the FCC Form 471 deadline window will require the applicant to seek a waiver for filing their FCC Form 471 late (USAC, 2017v).

FCC Form 471 acknowledgement is communicated when USAC issues "an FCC Form 471 Receipt Acknowledgment Letter (RAL) to both the applicant and the service provider(s) in EPC after the applicant certifies their in-window FCC Form 471" (USAC, 2017ac, para. 5). The RAL is linked to the primary account profile and provides methods to make corrections, and further discusses application procedures. FCC Form 471-allowable changes are much more extensive than the FCC Form 470. Almost any portion of the FCC Form 471 can be changed excluding the following items (USAC, 2017v):

1. Operational SPIN changes – switching service providers must be done through a separate process.
2. Changes to the services on the FCC Form 471 funding request that are not a result of Ministerial & Clerical errors (e.g., renegotiated contract terms or pricing).
3. Adding an entity to the discount calculation that was not listed in the original source document.
4. Revising NSLP data dated after the close of the filing window
5. Adding a category or categories of service on the FCC Form 470 after it has been posted.
6. Adding new services or changing service descriptions on FCC Forms 470 and RFPs after the forms have been posted.
7. Changes based on service provider documentation that were not used in the applicant's competitive bidding process or that are dated after the close of the filing window. (para. 5)

FCC Form 486 acknowledgement is communicated through an FCC Form 486 Notification Letter in an entity's E-rate Productivity Center (EPC) account (USAC, 2016f). This letter outlines the information the applicant provided in the original FCC Form 486 and verifies

the Service Start Date. If there are any circumstances causing a change to the Service Start Date, they will be addressed. Notification will also be available in the service provider(s) EPC account.

FCC Form 472 acknowledgement is communicated through the U.S. mail service with "an FCC Form 472 (BEAR) Notification Letter to the applicant and the service provider upon successful data entry of the BEAR Form" (USAC, 2017aj, para. 4).

Correct, change or extend processes. The SLD encourages applicants to continuously update their contact information in the EPC portal. From within the EPC, applicants can add users and rights to those functions, but there can be only one primary point of contact. Contact information on applications or other FCC forms can be made by emailing the changes to the SLD using their website. The email must contain a memorandum signed by an authorized person and make must note of the application or form number that requires the point of contact to be changed. Most changes can even be made "post-commitment" (USAC, 2017d).

There are several other processes that might require change request during the E-rate process, and they all require certain procedures and rules that are available on the SLD website (USAC, 2017c). They include:

1. Change of the service start date or contract expiration date for an FRN.
2. Reduction or cancellation of funding for an FRN.
3. Change of the Service Provider Identification Number (SPIN) for data entry errors or for other administrative reasons such as company mergers.
4. Operation SPIN change; that is, changing service providers for a valid reason.
5. Service substitution: changing one like product/brand for another like product that serves the same function originally requested.

6. Deadline extensions on filing specific FCC Forms.
7. Invoice extensions.
8. Transfer, disposal, or trade-in of equipment.

This overview on the impacts of E-rate application process and change demonstrates the extensiveness of the program and outlines only a glimpse of E-rate over nearly two decades. However, with all the literature available on the E-rate program, and its continued evolution, it is evident that the program is helping schools realize additional funding needed for telecommunication services.

E-rate Funding and its Impact on Technology and Technology Infrastructure

In today's world, technology in schools is not a new innovation or policy. From a historical standpoint however, technology in schools has been a fast-moving target. The E-rate program has attempted to subsidize funding for schools and libraries for two decades. This section of the review examines how E-rate funding has influenced technology and technological infrastructure in schools that use this subsidy. For instance, has successful receipt of funding helped schools infuse technology and how? Have schools experienced both positive and negative results and why? Are there recommendations from schools using the E-rate program? Have schools needed to change their operations in any way to achieve positive results from the E-rate program?

Early literature. A report prepared for the U.S. Department of Education analyzed the first two years of the E-rate program through an extensive review of E-rate administrative records (Puma, Chaplin, Pape, & Educational Resources Information, 2000). Data was reviewed for every school and library in the United States that applied for E-rate. This study was part of a

U.S. Department of Education initiative called Integrated Studies of Educational Technology, or ISET (Paige, Hickok, Ginsburg, & Goodwin, 2003).

Puma's team found that E-rate dispersed almost $4 billion during the program's first two years, with "84% going to the nation's public schools" during the first year (Puma et al., 2000, p. 1). The second-year numbers showed deeper penetration with approximately "13,000 public school districts, 70,000 public schools, 5,000 private schools, and 4,500 library systems participating in E-rate" (Puma et al., 2000, p. 1). Interestingly, this study determined that larger school districts had much higher application rates than schools with a higher level of poverty. One reason for this disparity may be that larger schools and districts likely had a higher level of resources and exposure to E-rate than did highly impoverished schools (Puma et al., 2000).

Puma's findings are in agreement with a 2001 study (Staihr & Sheaff, 2001), that evaluated rural funding levels for 15 states over the first two E-rate funding years. Staihr's team found that rural applications in six states were below the per capita average of all 15 states combined. This study attributed this inequality to differences in technological infrastructure and need, difficulty in planning infrastructure improvement in hard to reach rural areas, and most likely, some rural areas were simply more aggressive than others in applying for E-rate funding (Staihr et al., 2001).

This study focuses on two BIE-funded Native American schools in rural America. Accordingly, it was important to discover literature specific to this population. In 1998, the Clinton/Gore administration directed the Department of Commerce to study the state of technology in Native American communities. The study examined the difficulties to technology infrastructure development and recommended solutions to overcome them. The proposals included that the federal government should lead an initiative that would assist American Indians

to gain increased access to information technologies. Vice President Gore asked the Bureau of Indian Affairs (BIA) to work with each of their schools and assist them in making E-rate a priority over the next several years (Chaplin, 2001).

Because American Indians were not specifically targeted with the first ISET studies above, Chaplin examined "how public schools' participation in the E-rate program varied by their percentage American Indian enrollment, with a focus on BIA schools" (Chaplin, 2001, p. 1). The study reviewed the first two application years of the E-rate program and demonstrated that an initial gap in funding between rural/poor districts was possibly closing. Chaplin accredited this to the Bureau of Indian Educations' greater emphasis and support of the E-rate program.

He argued that this resulted in greater interest, available resources, and the development of BIE E-rate support assisting BIE-funded schools. These implementations helped BIE schools better navigate the E-rate application process and represented an increased application rate. Chaplin reported that BIE schools had improved their application rate from 35% in 1998 to over 95% in 1999 (Chaplin, 2001). BIE schools were also credited with "receiving more than three times the national average E-rate funding per student" (Chaplin, 2001, p. iv), an amount resulting in gains from first year funding of only $300,000 dollars to second year funding of $6 million.

However, Chaplin's study only reviewed actual E-rate requests made by the BIE under consortium applications made on behalf of the BIE, and not actual individual requests by BIE-funded schools and school districts. This fact is evident by this quote in the study stating (Chaplin, 2001):

> …the BIA greatly stepped up its involvement in the E-rate program between Year 1 and Year 2. Indeed, BIA staff told us that while they applied on behalf of few BIA schools during the first year of the program, they applied on behalf of all BIA schools in the second year. (p. 10)

A deeper look might have examined how many BIE-funded schools applied for E-rate funding on their own and what the total amount was. However, this was not the case; the data that Chaplin was given by the BIA was the only available information he had at that time. A closer look at current data provides a different story, at least for the second funding year.

Using data retrieved from the USAC Funding Request Data Retrieval Tool (USAC, 2018c), determines the data Chaplin was given for 1998 was rather accurate. The BIA applied for a consortium application consisting of 58 funding requests consisting entirely of Internal Connection requests. The total pre-discount amount on the application was for $361,579.00 dollars, and the total amount disbursed by the Schools and Libraries Corporation (SLC) was $322,000 dollars. Of the 58 requests, only one was denied funding because the discount rate was below 70% for that school, and during that program year Category Two (Priority II) funding was not funded below 70%.

Using data drawn from the USAC Funding Request Data Retrieval Tool (USAC, 2018c), determines the data Chaplin was given for 1999 was not accurate. The BIA applied for a consortium application consisting of 438 funding requests for Telecom, Internal Connections and Internet Access. The total pre-discount amount on the application was for $7,231,727.00 dollars, but the total amount disbursed by the Schools and Libraries Corporation (SLC) was only $1,086,529.00 dollars. Of the 438 requests, 43 were denied funding – 42 because 30% or more of each request contained ineligible services or equipment, and one because it was a duplicate FRN. The 42 requests that were denied accounted for $1,272,417.00 dollars of the original $7.2 million above. However, the anomaly is that 237 of the requests had no disbursement due to invoicing errors. According to the disbursement records (USAC, 2018c), this accounted for another $4,694,095.77 dollars undisbursed even though it was funded.

These examples are meant to demonstrate that E-rate does in fact provide funding to eligible applicants, and that it was utilized to provide necessary technologies in many of the BIE schools. Nonetheless, it also demonstrates that E-rate funding can be lost, reduced, or possibly mismanaged, thus creating a negative impact for the requesting entity. A loss of funds like this obviously created a dilemma for the lead agency, the primary service provider(s), and the BIE-funded schools within the consortium application.

In 2000, the Benton Foundation in partnership with the EDC/Center for Children and Technology released a study called *The E-rate in America: A Tale of Four Cities* (Carvin, 2000). This study examines four school districts and how they used the E-rate program and communicates lessons learned for interested school administrators, educators, policymakers and general interest groups (Carvin, 2000). Research experts visited Chicago, Cleveland, Detroit, and Milwaukee; four highly impoverished cities serving approximately 800,000 students and over 1100 schools at that time. Carvin's, 2000 demographic breakdown of each district is: Chicago (430,000 students, 578 schools), Cleveland (77,000 students, 118 schools), Detroit (175,000 students, 250 schools), and Milwaukee (113,000 students, 160 schools). E-rate funding received for each of these districts was (Carvin, 2000):

1. Chicago: Funding Year 1998 ($27 million) and Funding Year 1999 ($74 million).
2. Cleveland: Funding Year 1998 ($26 million) and Funding Year 1999 ($12.5 million).
3. Detroit: Funding Year 1998 ($18 million) and Funding Year 1999 ($18 million).
4. Milwaukee: Funding Year 1998 ($23.4 million) and Funding Year 1999 (No data listed).

Though researchers found that all the school districts used various courses of action in planning, applying and utilizing E-rate funding, several E-rate specific commonalities were uncovered.

First, all of the districts were able "create robust, high-quality networks that would never have been put in place without E-rate funding" (Carvin, 2000, p. 16). This was attributed to the fact that there was no set limit on the amount of funds that schools could request for Internal Connections. E-rate funding also freed other resources meant for technology infrastructure that could be used for items that E-rate does not fund, such as computers, learning software, peripherals, and electrical upgrades necessary to accommodate new technologies. Carvin quoted a Detroit director as saying (Carvin, 2000):

> …director of information systems management for the district, described the E-rate program as "a godsend:' Previous efforts to design and implement a systematic networking structure never had adequate funding behind them. Even now, he reported, the district's technology efforts would come to a "complete standstill" if the E-rate program were canceled. The E-rate program has also generated at least $6 million in savings for the Detroit Public Schools. Davis anticipates that these savings will be transferred to the instructional technology department and used to support professional development programs. (p. 23)

Conversely, with the new funds for infrastructure, came the need to resource "electrical upgrades and hardware" (Carvin, 2000, p. 17). Several of the districts had to rely on state funds and grants to plan and create electrical and building upgrades to support new servers, switches, cabling, equipment racks, and other ancillary equipment to facilitate the E-rate projects. Districts also had to come up with funds to bring technological hardware into the classrooms to take advantage of the new infrastructure.

This is no easy feat for larger school districts like Chicago, consisting of 570 schools, many of which were over 100 years old (Carvin, 2000). This situation of multiple project dependency caused delay in E-rate project completion and strained relations with E-rate service

providers and building contractors. For instance, Milwaukee stated "vendors also faced problems; there were often time lags between when they signed legal contracts and when the district actually secured its E-rate funding. Only then could the district authorize vendor work to begin" (Carvin, 2000, p. 24).

Second, was a concern that the E-rate program does not address future needs necessary to sustain the existing network infrastructure. Some of the districts expressed concern that the "Schools and Libraries Division is not yet emphasizing to schools and districts the need to plan how they will meet ongoing costs" (Carvin, 2000, p. 17). Because requirements for technology will ever increase, the concern was that E-rate funding will continue and for policy to increase the annual funding cap so schools can depend on the E-rate program's continuous ability to meet funding demands. For example, in the first two years of E-rate, Chicago received $101 million, "making it the second largest beneficiary of the program. Only New York City received a higher E-rate subsidy" (Carvin, 2000, p. 20). These monies were only getting Chicago started and thus far, had only impacted 260 of its schools over the first two years of E-rate. Chicago had plans to continue Wide Area Network (WAN) upgrades throughout the district and internal infrastructure projects for its remaining schools. This made them highly dependent on continued E-rate funding.

Third, administrators shared feelings that the E-rate program made it necessary for various departments to share information in order to plan, budget, and implement for E-rate success. This influenced them to be better planners, to obtain new knowledge and skills, and obtain better collaboration techniques. These factors assisted them in establishing better operational, business, and accounting methods. In conflicting remarks, Cleveland discussed collaborative challenges between its Educational Technology Office and its Curriculum and

Instruction Department causing "limited influence of the instructional technology group on the district-level planning for the use of technology" (Carvin, 2000, p. 22).

An example of conflict resulted when the Cleveland district financed "test preparation and integrated learning systems that did not take advantage of E-rate-funded networking infrastructure that has been put into place over the past two years" (Carvin, 2000, p. 22). Additionally, in some cases, participants reported that "high-level school administrators and community stakeholders need to be made aware of the impact of the E-rate" (Carvin, 2000, p. 18). Evidently, not everyone was positive about the E-rate program or its benefits to funding technology. Likewise, administrators in some of the districts reported that their supervisors are not fully aware. One of the recommendations coming out of this study is to identify ways to better inform decision makers, school districts and schools about the benefits of E-rate.

Almost parallel to Benton's study above, Harris examined E-rate Funding Year 1999 to conclude if Arkansas school districts received disparate funding comparative to diverse poverty and technology personnel indicators. Harris also sought to determine what factors might have caused "214 Arkansas public school districts to participate in the program and 96 districts to not participate" (Harris, 2001, p. 10). In the Harris dissertation, districts were categorized as small (79 - 974 pupils), medium (1,010 - 2,932 pupils), and large (3,082 - 25,308) pupils. The total numbers of students and schools studied was not given in the study. During the second E-rate funding year, "Arkansas schools, libraries, and educational cooperatives received $10,491,148 in E-rate funding" (Harris, 2001, p. 10).

Harris determined the relationship between poverty and NSLP enrollment showed some disparity in factoring in what E-rate funding was received. His finding revealed that higher poverty rates showed higher return on funding received than did the NSLP data used by a district

or school. He attributed the low free and reduced lunch rate to "underreporting by the districts due to under-participation by the families within a district" (Harris, 2001, p. 86). Harris concluded that if the E-rate program used Federal poverty rates instead of NSLP data, it would be a more accurate representation of the actual poverty rate of a school district. This argument closely relates to other NSLP arguments, such as the Bush administration recommendation that high-cost areas should be largely targeted instead (Dickard, 2002); and to use an index "based on the number of students in a school district who qualify for Title I funds" (Carvin, 2000, p. 13).

Harris found a strong relationship between schools that had a full-time technology person versus those that had a less than full time technology person. His deduction was districts that could afford a full-time technology were large districts and only employed one person. This resulted in excessive workload on the one full time person, and in many cases, findings revealed these employees were already excessively taxed with normal district wide technology operations. Thus, they had little time to invest in E-rate. Those schools that used less than full time persons, normally had employees at the school level that were assigned additional duties in technology. Harris determined schools with less than full-time technology persons received E-rate funding at $38.66 per pupil while districts with full-time technology people received $20.72 per pupil (Harris, 2001, p. 86). The study found schools with less than full time technology persons, usually had several employees working in this capacity, providing better resources to apply for E-rate.

For the 96 school districts that did not apply for E-rate, Harris determined several factors that might have attributed. Participants blamed excessive paperwork and lack of training as the two primary reasons for non-participation. Some districts began the process, but failed to complete; "49% (47 out of 96) non-funded districts filed at least one form with Schools and

Libraries Division (SLD) and then failed to complete the required paperwork for funding" (Harris, 2001, p. 87). Harris also reported that 36% of the non-receiving districts have a full-time technology person and deduced that this may have played a role based on his previous findings.

Harris made serval recommendations, but one closely parallels the Benton study above. That "non-participating schools become more informed about the E-rate program. This one step would probably overcome any doubts or misgivings a district might have about the program" (Harris, 2001, p. 90).

Recent literature. In his 2008 Dissertation, Dempsey's case study examined the effectiveness of E-rate as a "federal diffusion project in influencing technology behaviors in one rural school district in Oregon" over 10 years (Dempsey, 2008, p. iv). The school district consisted of seven schools with population of approximately 3000 students.

Dempsey revealed the school district received over $459 million via the E-rate program since 1998" (Dempsey, 2008). Since they already had new Internet access provided by a separate source through the school district, they invested E-rate funds into Telephone discounts and internal networking equipment. Servers, routers, switches, and cabling were used to build a district level Wide Area Network and internal school Local Area Networks (LAN). By 2008, they had fiber connections to all their schools except one and had begun using E-rate funds to support their Internet bandwidth. All but one school had a LAN with internal gigabit speed, and their current demand for Internet bandwidth was met with a 16Mbs connection. "In comparison, their total bandwidth requirement in 1998 was only 1Mbs" (Dempsey, 2008, p. 109).

Over its ten-year span of E-rate funding, Dempsey discovered that the district "became increasingly dependent upon higher reimbursement rates as their demand for bandwidth

increased" (Dempsey, 2008, p. 109). This supports Hudson's findings that a full use of the applications provided by Internet 2 requires nearly 10 megabits per second" (Hudson & Rockefeller, 2009, p. 2). This also supports earlier theories that innovative uses of the Internet in classrooms will help "break down the walls" (Chapman, Loveless, & Roberts, 2000, p. 327) and open up classrooms to the information age, and at the same time, increase the need for more computers in the classroom to connect to new and powerful learning technologies. Over time, this means that the need to increase bandwidth in our schools will intensify.

Dempsey used Roger's diffusion (Rogers, 2010) of innovation model theory to define the federal E-rate program as the "change agent for the implantation and adoption of the Internet in this school district" (Dempsey, 2008, p. 109). Though, not without challenges, his study determined that this school district was successful in implementing Internet access over a period of ten years using the federal government as an "initiator of innovation" (Dempsey, 2008, p. 109).

In his dissertation, Vazquez-Cruz sought to "describe the effect of the E-rate program, on a school district's K.-12 technology implementation plan…,specifically, relationships between classroom teachers and school administrators' perceptions about technology advancements in the district" (Vazquez-Cruz, 2012, p. 17). The school district studied was in rural Texas, consisted of 3,981 students, seven schools, and over 75% of the students enrolled were highly impoverished. Unfortunately, no E-rate funding amounts were ever given in the dissertation. Though a portion of his study is outlined under Technology Planning above, several other E-rate related impacts are relevant with his study.

During an interview, the former superintendent explained why E-rate was a positive program for the school district (Vazquez-Cruz, 2012): "…the district is no longer limited by its

budget or the economic conditions of the surrounding communities, and can provide advancements in technology similar to those offered in more affluent school districts" (Vazquez-Cruz, 2012, p. 33). He emphasized that the district uses E-rate support for Internet access because of its importance to bringing educational technology offerings to the district's students and faculty. To illustrate, the superintendent expressed reliance on the E-rate program for public safety and versatile learning including: (Vazquez-Cruz, 2012):

> Cell phones for rural bus drivers; better communication between faculty and parents; distance learning opportunities that allow students to 'travel' to museums and around the globe; preparing students to meet state mandated testing requirements; technologies that allow students with disabilities and disadvantaged students to participate in classrooms in the same fashion as other students. (p. 77)

The first year of E-rate enabled the district to replace dial-up modem Internet connections in every school, thus allowing the district to incorporate LANs in each school, a Wide Area Network connecting the schools to each other and the district, and technology in the classroom for the first time. From 1998 through 2003, the district was able to use additional funding commitments to connect one networked computer in every classroom. In time, the district was able to lease faster T-1 lines supporting increased Internet delivery to the district and each school.

In 2006, E-rate funding enabled the district to run Gigabit fiber cabling and lightweight Wireless Access points throughout the district and schools improving internal network speeds and enabling wireless connectivity. Eventually, the district was funded to replace 500 network connections of older cabling with high speed gigabit (CAT6e) cabling throughout the schools and district headquarters. Shortly after, the district was able to replace switches, servers, and ancillary equipment.

A statement from the district instructional technology director emphasizes the impact: "Universal Service Fund support helped immensely to provide internal connections equipment. I do not know what we would have done without the internal connections equipment provided by the E-rate Program" (Vazquez-Cruz, 2012, p. 11). The director was speaking of the new CAT6e cabling, gigabit Ethernet connection, fiber connections, and a new CISCO infrastructure which allowed the district to have multiple LANs managed by "a multiplicity of CISCO switches and routers; the highly developed WAN allow district technicians to oversee the district's network and to make sure it never crashes" (Vazquez-Cruz, 2012, p. 11).

Summary

E-rate program subsidies target technology innovation; getting connected to educational technologies through funding discounts that provide bandwidth and technology infrastructure to carry the information to the classroom (Hudson & Rockefeller, 2009). Since 1998, the program has drastically changed from a paper-based application process to a fully functional online portal capable of accomplishing nearly every facet of the application process.

Policy seems to have changed its direction as well. For instance, early policy was devoted towards the "digital divide" ensuring the nation's highly impoverished and rural communities had equal access to telecommunication services. More recent policy within NPRM 2, attempts to fund more applicants through raising the funding cap, delivering broadband to every school in America, and enforcing a Category Two services budget limiting spending on a per student cap. However, technology is a moving target, and without change, it is likely E-rate funding may not have succeeded as a program for so long. Likewise, it is important to ascertain what changes are beneficial and which ones are not.

With regards to E-rate policy change, the above literature provides evidence and justifications for the many changes over the years. It is likely that one could find as many satisfied people as unsatisfied people regarding these changes. For instance, the original legislative intent for E-rate was to bridge the gap between the haves and have nots. In reviewing a report from 2005, data from E-rate disbursements showed that "100% of the funding for Category Two services went to applicants with a 90% discount rate" (USAC, 2005, p. 45). This was an amount totaling $ 245,433,000 dollars in E-rate funding. Likewise, all the applicants in the country under a 90% discount were not funded for Category Two services.

Over the course of E-rate program history, this example happened often. Thus, the most highly impoverished get funded, and the remainder do not. This example is likely not the only reason for funding changes made in NPRM 2, but it was a chief complaint made in many of the responses received in NPRM 1 and NPRM 2 (FCC, 2013, 2014a). It would be prudent to examine policy change and impact in order to inform policymakers so they might determine better ways to equally fund E-rate applicants through better formulas and more funding.

The E-rate application process has undergone changes hundreds of times; each year has brought a new Eligibility Services List and many other changes to FCC Forms, deadlines, reviews, and planning requirements. Jayakar, et al. depicts E-rate as a program that "has put in place a complicated, multi-stage process for reviewing applications" (Jayakar & Park, 2009, p. 4). Jayakar implied the USAC was forced to implement an arduous application and review process given the continual accusations of fraud and misuse of E-rate funds by applicants and service providers. Jayakar also reported as a result of the "complicated and resource-intensive nature of the application process," some applicants failed or elected not to apply for E-rate (Jayakar & Park, 2009, p. 5). Harris's study compliments these findings; he revealed

administrative burdens such as excessive paperwork and lack of E-rate expertise as factors contributing to school districts failure to obtain E-rate funding (Harris, 2001).

Now, with the implementation of the EPC, applicants have another change to contend with. Though not without contention, the EPC has over gone several revisions, and hopefully, will provide applicants with a better way to manage E-rate and receive funding. Time will tell.

Regarding E-rate funding and its impact on technology and technology infrastructure, literature has provided evidence that billions of dollars of funding have been provided for eligible telecommunications services since 1998. New technology can implement change, which can create other dilemmas for applicants to compete with. For instance, many have argued that E-rate funding should provide more funding towards subsidizing classroom technology, but this subject has proven futile. A teacher in another Benton study explained (Dickard, 2002):

> Lack of hardware has limited what teachers can do with the district's high-speed network. "It's a great leash, but there's no dog," says Shane McConnell, chair of the English department at Cleveland's East Technical High School. However, schools are still faced with the challenges of providing classrooms with hardware to access this new technology. (p. 22)

Nearly two decades of the E-rate program have transpired, and E-rate subsidies still require schools and libraries to find other ways to subsidize classroom technologies meant to connect and receive educational information from E-rate eligible infrastructure and bandwidth. Though it has been suggested for the E-rate program to change policies to allow more versatility to support these needs, it is a doubtful prospect (Hudson & Rockefeller, 2009).

A common theme seen within the review of literature is that change is inevitable, and E-rate applicants continually apply for and receive E-rate funding. Though E-rate may be inundated with policy change; application process change; and funding potential is often

ambiguous, E-rate is likely a viable resource for schools seeking funding discounts for eligible services.

Chapter 3: Methodology

This chapter summarizes the methods and procedures used to collect raw and empirical data necessary for this case study. The purpose of this case study was to develop a comprehensive understanding of the real-world issues (both positive and negative) encountered by applicants attempting to realize opportunities available through the E-rate program. The study's outcomes confirming the receipt of services sought to determine how E-rate influences technology, and hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from this powerful funding source.

With multiple changes in the E-rate program expanding nearly two decades, it is necessary to understand what E-rate applicants have experienced, and what the impacts of those experiences are (past, present, and future). This study examined E-rate as a national program driven by public policy, and explored a micro version of the E-rate program as experienced by two small and remote Bureau of Indian Education (BIE) funded K-8 schools on the Pine Ridge Indian Reservation in South Dakota from 1998 through 2018.

Research Questions

Research questions for this study were developed to explore the FCC E-rate Program and processes using a pragmatic approach to qualitative study (Creswell, 2012). The objective was to analyze the experience of two distinct entities (schools) and human stakeholders within those schools. The collection of raw and human data added to the distinctiveness gained from a multiple-case study (Yin, 2014).

To accomplish this, three research questions were used to intensely investigate how the nature of the E-rate program policy, application processes, and funding has influenced, and impacted applicants based upon their experiences over time. These questions gained insight into

the E-rate phenomenon that can provide useful recommendations for E-rate applicants, policymakers, and stakeholders to implement better procedures and policy, or derive more benefit from the program. Significant data uncovered was helpful in answering the following research questions and will add to this body of knowledge.

1. How has the nature of the FCC E-rate Policy and Program change influenced the usage of E-rate?
2. 2.How has the nature of the FCC E-rate Application process influenced the usage of E-rate?
3. How has the nature of the FCC E-rate funding influenced technology and technological infrastructure?

Choosing Qualitative Case Study Research

Qualitative research seeks to "explore and understand" (Creswell, 2009, p. 4) the how and why people, groups, or organizations characterize a societal situation. With E-rate, sources of data are collected from the applicant locations or are closely linked to them through national, state and local E-rate data sources. This is a qualitative study of a federal program, which seeks to discover knowledge, rather than construct it; the role of the researcher was personal, rather than impersonal (Stake, 1995). The study explored the complexities and human experiences associated with the E-rate program over time, and discovered interrelationships that existed between the program, the people, and the facilities involved. This case study is personal because it has been experienced by the researcher as a practitioner and conclusions relied on "direct interpretations of events" (Stake, 1995, p. 40). Data was used to determine how the participants have used E-rate funding over the years. The interactions and observations between the researcher and the participants offer a more personal view of the nature of the E-rate program.

Creswell also defines case study as a viable qualitative strategy; research is directed deeply into a "program, action, or interaction" (Creswell, 2009, p. 13). For instance, this study sought to discover the nature of the E-rate program as experienced by two small elementary schools and how can this information inform schools and policymakers how to better manage and derive benefit from the E-rate Program? To study an educational experience, one can attempt to "catch the complexity of a single case" (Stake, 1995, p. xi) in order examine "people and programs" (Stake, 1995, p. 1). Case study research seeks to answer the "why" and "how" of a contemporary experience, and places the researcher in a position of "little or no control over behavior events" (Yin, 2014, pp. 643-645).

An intriguing excerpt from a recent FCC communique (FCC, 2017d) supports interest in how the E-rate program has impacted our national school system over a course of time:

> The FCC's plan complements the efforts of states and localities to bring advanced telecommunications to America's classrooms and libraries. When the E-rate program was established in 1996, only 14 percent of the nation's K-12 classrooms had access to the Internet. Today, because of the FCC's E-rate program, virtually all schools and libraries have Internet access. (p. 1)

When deciding to study E-rate, a billion-dollar federal subsidy program, it was decided to capture a micro version of the E-rate program as experienced by two smaller BIE elementary schools. Thus, this qualitative case study sought to illustrate and assess the impact E-rate has had on these schools since 1998.

Research Design

The E-rate program is a contemporary phenomenon. To understand its nature, it is necessary to determine the impacts and experiences of these two schools resulting from policy change, application processes, and technological growth over the time period of this study. This study used a multiple-case design, examining the experiences of two schools or cases using

replication logic and an embedded approach (Yin, 2014). As a result, each school was treated as separate cases including the collection and analysis of data from multiple sources, interviews and observations from each case study. The results for each case are included in the findings and used as the focus for a summary report (Yin, 2014).

Preliminary study leading to this research determined how many entities applied for E-rate from 1998 through E-rate Funding year 2017, and how this process impacted their diffusion of innovation (Rogers, 2010) spanning nearly two decades. There are literally hundreds of thousands of participant pools (schools and libraries) that have used the E-rate program over the last 20 years. The scale of the application pool suggested a more pragmatic framework involving case study (Creswell, 2012).

The two schools in this study reside in the state of South Dakota. E-rate data was examined to guide the case study. Three separate years of data (1998, 2008, and 2013) were pulled from the Schools and Libraries data retrieval tool (USAC, 2018c) to determine the total amount of E-rate funding requests that were made and what the disbursements of those requests were. The assumption was this data would assist with developing research direction and questions that would provide an azimuth for a small and manageable case study yielding an acceptable dissertation proposal.

During the first E-rate funding year (1998), there was a total of 1,211 separate funding requests for E-rate discounts in South Dakota. These 1,211 funding requests sought $3,871,766.25 dollars. Of those requests, 812 were funded by the Schools and Libraries Division totaling $2,958,617.99 dollars. From the 812 funding requests, 652 funding requests received disbursements totaling $2,010,589.78 dollars, with the following breakdown:

- Total Funding Requests: 1211

- Total Monies Requested: $3,871,766.25 dollars
- Total Requests Approved/Committed: 812 or 67% of 1211 original funding requests
- Total Monies Originally Committed: $2,958,617.99 or 76% of the original amount requested of $3,871,766.25 dollars
- Actual Requests Receiving Disbursed Funds: 652 or 54% of 1211 original funding requests
- Actual Monies Disbursed: $2,010,589.78 dollars or 68% of the original amount requested of $2,958,617.99 dollars

During E-rate funding year 2008, South Dakota numbers changed in many areas. For instance, only 715 funding requests (59% of those in 1998) were reported, but for a much higher total funding amount of $7,942,418.97 dollars. This is a 204% increase in requested monies with a significant reduction in actual funding requests. The number of requests approved was 669 (94% of the original funding requests) for a total commitment amount of $6,909,299.15 dollars (87% of the original amount requested of $7,942,418.97 dollars). Ultimately, 592 (88% of the original funding requests of 715) commitments received disbursed amounts totaling $5,839,412.11 dollars (74% of the original amount requested of $7,942,418.97 dollars).

There were several years when the funding requested across the United States far exceeded the funds available to fund Category One and Category Two requests. Funding year 2013 was one of these years, and as a result, the FCC gave USAC permission to allow the Schools and Libraries Division to disallow all Category Two funding requests. A review of the data shows the negative impact for South Dakota applicants below (USAC, 2018c):

- Total Funding Requests for Category Two Services: 59

- Total Monies Requested: $1,843,674 dollars
- Total Monies Denied: $1,843,674 dollars

Using the data above, opened the existing approach – to review data from 1998 to present-day on two small elementary schools. Examining the information stimulated research curiosity that seeks answers of "how" and "why" E-rate influences technology, and hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from the FCC E-rate Program.

Assumptions

This study used a case study approach (Creswell, 2012) and assumes using systematic investigation would prove both credible and guide discovery of more detailed findings. For instance, studies have already determined using E-rate can positively impact the use of a tangible technology in a school. Yet, even positive impacts or experiences during an E-rate funding year can yield considerable challenges or negative outcomes in the future.

Four assumptions were made with this study. First, it is believed that positive outcomes result with technology infrastructure and internet bandwidth capabilities with schools using the E-rate program versus those that do not. Second, the empirical data used and discovered in this study would support the study's validity and reliability towards the contribution to its body of science. This data was expected also to show that E-rate's intended goals can be accomplished as intended by the FCC's initial federal decree and purpose for E-rate. Third, the study assumed that E-rate is a complicated and arduous process and without proper planning and involvement from school officials (educators, technologists and consultants), obstacles will arise. These obstacles might be failure to receive funding, accumulation of program reviews or audits, and even dissention with application participants. Lastly, there will be external and internal variables

that will impact on the E-rate application process. These include a myriad of items, such as State Education Agency (SEA) technology policy, Tribal controls, lack of FCC E-rate funding, employee turnover, and constant change to the E-rate application process and rulings.

Site Selection

The BIE is formerly known as the Office of Indian Education Programs (OIEP), and was renamed and established on August 29, 2006, to reflect the parallel purpose and organizational structure BIE has in relation to other programs within the Office of the Assistant Secretary-Indian Affairs (DOI/ED Indian Education Study Group, 2014). The BIE is responsible for administering the only national education system for American Indian children and adults. "The BIE serves nearly 48,000 American Indian Students in 183 elementary and secondary schools, located on 64 reservations in 23 states. Of these, 57 are BIE-operated and 126 are tribally-operated under BIE contracts or grants" (DOI/ED Indian Education Study Group, 2014). Federal laws, treaties, and court decisions mandate the education of Indian children as a federal responsibility.

The BIE is the only federal entity that regularly participates in the E-rate program (White, 2013). As a federal entity, federal laws and regulations govern it. The treatment of BIE-funded schools has evolved to where the BIE-operated schools are treated differently from tribally-operated schools. To the BIE-operated schools, the BIE is a school district. To the tribally-operated schools, the BIE functions as a State Education Agency (SEA).

The Bureau of Indian Affairs (BIA) supports the BIE information technology requirements, which encompass multiple and varied needs of students, administrators, teachers, and central office staff. The primary conduit of information services and delivery is the Educational Native American Network (ENAN 2) – providing network connections between BIE

locations and Internet access (BIA, 2007). ENAN 2 provides standards-based connectivity, security, content delivery, web services, distance learning, GPS school-bus tracking and wireless communication, email access, and education application access that encompasses all BIE school networks, platforms, and other computing environments to provide timely access to educational resources and data. ENAN 2 connects some, but not all BIE-funded Schools to each other and the Internet. There are BIE tribally-operated schools in the BIE that elect to procure their own Internet bandwidth through other service providers.

In establishing the Office of Native Affairs and Policy, FCC Chairman Julius Genachowski said, "Tribal lands and Native communities suffer unacceptably low levels of communications services, especially broadband" (FCC, 2010a, p. 1). American Indian reservation schools represent some of the highest impoverished areas within the country - knowledge easily searchable under U.S. census data. Within the BIE, over 95% of K-12 students attend schools on reservation lands; the remainder attend off-reservation boarding schools. Accessible E-rate funding for broadband is essential for American Indian Schools.

In a case study, the researcher's perspective becomes an integral part of the research and data interpretation. From February 2004 through December 2013, the researcher worked for the Bureau of Indian Education (BIE) and the Bureau of Indian Affairs (BIA) as a teacher, technology specialist, and primary E-rate Coordinator in support of 183 BIE-funded Schools in the United States. The primary place of duty from 2004 through February 2009 was on the Pine Ridge Indian Reservation in South Dakota. During this time, the researcher became highly involved with the seven BIE-funded schools on the Pine Ridge Indian Reservation. From February 2009 through December 2013, the researcher was employed by the BIA as the primary E-rate Coordinator supporting all 183 BIE-funded schools in the United States. From September

2014 to present, the researcher works at one of the BIE-funded schools on Pine Ridge as the Technology and Facilities Coordinator.

For reasons of anonymity, this study refers to the study research sites as School "A" and School "B." In September of 2014, the superintendent of School "A" was contacted and asked if the school could be used as a research platform for a dissertation study. Permission was granted and preliminary research review and design commenced. After gaining operational traction in the school and conducting dissertation research, School "B" was added to the study for more variety and validity.

Both School "A" and "B" are PL-100-297 tribally controlled Grant Schools (100th Congress, 1988), located on the Pine Ridge Indian Reservation in southwestern South Dakota (Figure 7). Both are elementary schools with approximately 150 (School "B") to 330 (School "A") Native American students in Pre-K through eighth grade. The communities served are all located on the Pine Ridge Indian Reservation comprised of the two counties of Oglala Lakota or Bennett. One hundred percent of the students in both schools qualify for the National School Lunch Program's (NSLP's) free and reduced school lunch program. Many students live within Oglala Lakota County (AKA Shannon County), known as one of the poorest counties in the United States with an unemployment rate of 12.9% or higher and a poverty rate of 44.2% (United States Census Bureau, 2014; Frohlich, 2015). The remaining students reside in neighboring Bennett County, which shares nearly the same poverty and unemployment rates.

The people from the Pine Ridge Indian Reservation are mainly from the Oglala Lakota Band of the commonly known Great Sioux Nation. The name Sioux comes from the Ojibwa Tribe, who referred to them as na-towe-ssiwa or "people of the alien tribe," which was shortened by French settlers to Sioux (Gibbon, 2008).

The Sioux are composed of three distinct groups: the Dakota, the Yankton-Yanktonai, and Lakota, the latter of which are larger in population then the first two combined (Gibbon, 2008). The Lakota are also known as the Teton-Sioux and include the sub-divisions of Oglalas, Sicangus, Hunkpapas, Minneconjous, San Arcs, Two Kettles, and the Blackfeet. School "A" and "B" communities are part of the Oglala sub-division or band (Gibbon, 2008). The Oglala Lakota, and all Lakota, have generally maintained close ties with their culture and language, although most speakers are Lakota elders and very few younger people are capable of conversing in Lakota. Today, fewer than 6,000 people can speak the Lakota Language (Lakota Language Consortium, 2017).

Figure 7. Pine Ridge and Rosebud Indian reservations. Data in figure are adapted from "South Dakota general map," by Wikimedia Commons, 2017 (https://commons.wikimedia.org/wiki/File:South_Dakota_general_map_1.png). In the public domain.

Data Sources, Collection and Analysis

Data was collected and compared from national, state, and local sources which reflect the E-rate application process, funding commitments, actual funding disbursements, and the human experiences realized or perceived. Data was gathered to help ascertain the very first instance

(funding year) each of the two schools sought E-rate services as early as 1998 through present day.

Data sources. National data was initially retrieved from several sources:

1. The Universal Service Administrative Company's Data Retrieval Tool (USAC, 2018c) for each school.
2. SLD interaction interviews as necessary.
3. The Schools and Libraries Division Program website and historical archives (USAC, 2017s).
4. The FCC website and historical archives specific to the E-rate program (USAC, 2017m).
5. The U.S. Department of Education and National Technology Plan history and guidance (USDOE, 2017b).
6. State Education Agency and Tribal data.

In the case of BIE-funded schools, state data was made available from both the South Dakota State E-rate Coordinator's Office (South Dakota Department of Education, 2016) and the BIA OCIO E-rate Team (BIA, 2016). These two entities provide E-rate training and assistance for schools and libraries within their span of support, and will be queried for all communication and correspondence between them and both schools in this study. Local data was retrieved from both schools and resource entities common to the BIE support system. These resource entities include the Oglala Sioux Tribe and the BIE Education Line Office (AKA Education Resource Centers) assigned to support all BIE-funded Schools on the Pine Ridge Indian Reservation (BIE, 2017).

Data collection. Data included information sources enough to fully narrate the

flow of each individual funding request during a funding year from start to finish. This established a story for each E-rate funding year to influence an informative study. This information was indicative in nature – where one source of information directed the research to another source, whether was actual data or investigative human questioning. An example of data collection and navigation is depicted in Figure 8. Using the data retrieval tool (USAC, 2018c) from USAC's Schools and Libraries Division Website, two funding requests are examined.

Application Number	FRN	SPIN	Funding Year	Orig Commitment Request	Committed Amount	Total Authorized Disbursement
123456	1234501	123456789	2013	$2,641,284.94	$2,602,442.52	$1,985,477.89
123456	1234502	123456789	2013	$501,137.42	$493,767.76	$167,716.48

Figure 8. Example of data collection. Example of two funding requests. Applicant identity information has been redacted to protect the privacy of the applicant. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

In this example, the school applied for E-rate discounts using one FCC Form 471 application (Number 123456). The school made two separate funding requests and received a separate Funding Request Number (FRN) for each one (FRN 1234501 and FRN 1234502). Both FRNs depict high dollar funding request with a significant reduction in final disbursement of funds. The next step is to determine as much about this funding year as possible from beginning to end.

The following information (in no order) is exhaustive and will be retrieved:

1. All E-rate process correspondence and FCC Forms. Obtainable from the applicant (if they obtained records) and the Schools and Libraries Division's many data retrieval tools.

2. All correspondence and documentation related to the service providers who provided quotes for service and the means of selecting the vendors (Quotes, contracts, emails, bid assessment and selection documents and project documents).
3. Eligible Service List for funding year (changes each year). Obtainable from the Schools and Libraries Division (USAC, 2017p).
4. Copies and outcomes of any Program Integrity Reviews, Audits, Appeals or other documents related to program review (USAC, 2017ag).
5. Status of the applicant's technology infrastructure (switches, servers, bandwidth, LAN and Fiber Cable, Topography, routers, and Child Internet Protection Filtering) at the time of application. This would also include a look at technologies that are not eligible for E-rate discounts such as most software and online learning curriculum. Obtainable from applicant if they maintained a technology plan or records of change.
6. Human interaction with the E-rate process is obtainable if the personnel involved in each program year are still available, either in the area or via other communication methods. Personnel might include business managers, technology coordinators, principals, teachers, state and national coordinators and information managers and service providers.
7. Personal observations conducted at both participant sites, including classrooms, server rooms, network diagrams, cabling, switching, wi-fi, Local Area Network, servers, content filtering, and other technology infrastructure.

This study assumed a variety of sources were necessary to effectively investigate each funding year associated with the two schools in the study. E-rate rules are strict about document retention (USAC, 2017i). As of November 20, 2014, applicants and service providers must

retain everything associated with the E-rate process for 10 years. Prior to November 20, 2014, document retention was five years. However, the Schools and Libraries Division maintains raw data for most forms as early as 1998. This researcher hoped that enough information could be retrieved from raw sources and human interviews to satisfy the scope of this study.

Analysis. In all data retrieval, a combination of data tools and human sources were used in order to establish an historical record with each funding request made by the school. In this study, historical context allowed the research to extend multi-dimensionally to investigate and triangulate all known process and interactions. Once multiple sources of data were retrieved, investigative techniques were used to develop a complete picture revealing a story. Stake discusses cases study data as "impressionistic" (Stake, 1995, p. 49), in that refinement of a particular piece of data can reveal a more complete picture or even point the researcher into a different direction.

For example, the possibility exists that, at first impression, the significant reduction in the FRN 1234501 (above) request for approximately 2.65 million dollars to a disbursement of 1.9 million dollars was because of an error on the part of the applicant. However, after further investigation, it might be revealed that the service provider quoted a new school network that contained items that were simply not needed in the school. During an interview, it may be discovered that the service provider offered the school a video conferencing platform and an email server as part of their proposal. But, after deliberation, the school may have decided to continue to use free email offered by the state of South Dakota. Additionally, there are much cheaper, and even free video conferencing technologies available. After recording these findings, the researcher continues – "qualitative study capitalizes on ordinary ways of getting acquainted with things" (Stake, 1995, p. 49).

So far, it is known why the FRN had a reduction in committed monies, but the entire experience or story associated with that FRN or funding year is not. Qualitative research requires observation and analysis of the E-rate process, coupled with the operational setting of the study (Stake, 1995). In this case study, that process needed to validate data sources, observations, and research that questioned and provided systematic triangulated research.

Recall the study's outcome sought to determine how E-rate influences technology, and hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from this powerful funding source. In the example, the data shows why the originally funding request was reduced. This opens the need to determine whether the SLD Eligible Service List (ESL) should be reviewed.

For instance, there was a time in the early years of E-rate where advanced technologies for Video Conferencing were not available. But as of 2013 (the funding year in the example), many online portals have implemented technologies that satisfy the video requirements and needs for teachers, students and school officials to connect with. As a result, there may be justification to suggest a change in the ESL to the FCC (a policy maker). This is just a small example of analysis of this FRN within the qualitative case study.

Further investigation must be applied to saturate the entire funding year and both FRNs. As an example, but not exhaustive, the evidence might lead to the following areas:

1. What positive and negative experiences to the applicant realize during the application process? How did this application year compare with others?
2. What other eligible E-rate equipment did the applicant receive discounts for and how did that equipment help or hinder technology in the school and classroom?

3. Did the applicant experience an extensive review process and did it seem fair or just? How did this funding year review compare to other funding years?
4. How well was 2013 ESL understood and how has the annual ESL changes effected the application process?
5. Are there any anomalies that impacted the E-rate process? For instance, some State Education Agencies might have technology requirements that impact what a school can apply for.
6. How did the school apply their technology plan to their E-rate needs and has the loss of the technology plan requirement effected their E-rate process?

Validity and Reliability

The investigation took an in-depth approach to develop essential narratives for each program year the schools applied for E-rate funding. To maintain construct validity and reliability, the analysis of this study's data collected relevant and multiple sources of evidence to triangulate and link significant answers for the chosen research questions (Bryman, 2008; Yin, 2014).

All sources of data collection were the same sources used by the FCC and USAC to develop reports for Congress and public use. Data collected was compared to data maintained onsite by the program participants. In addition, available human participants from each school, internal and external stakeholders, education agencies, and even USAC personnel were interviewed for information appropriate to each E-rate program year and as investigation directed the researcher. A case study spreadsheet was created on all data collected for future coding.

The replication logic and embedded approach of this study relied on an orderly data collection or evidence protocol from each participant site, followed up by investigative

questioning guided by intuition and evidence gathered by the researcher (Bryman, 2008, 2015; Yin, 2010). This included any redacted copies of emails, application reviews, audit trails, memorandums, and other paper forms available for collection. This process strengthened internal validity using time series analysis, gathering available E-rate data and experiences over time, since 1998 (Yin, 2010, 2014).

External validity was addressed by accepting Peter's restrictive approach that "the sum of government activities, whether pursued directly or through agents, as those activities have an influence on the lives of citizens" (Peters, 2012, p. 4). This study streamlined Peters' approach by asking facts of "how" the nature of E-rate policy change, application process change, and funding have impacted program participants (Yin, 2014)?

Summary

The ambiguity of federal policy and programs is a commonality in the United States. This study explored how the nature of change and funding for one federal subsidy program impacts schools in the United States. The FCC E-rate program has committed approximately 45 billion dollars to applicants seeking eligible telecommunications discounts since 1998.

The purpose of this case study was to develop a comprehensive understanding of the real-world issues encountered by applicants attempting to realize opportunities available through the E-rate program. The data collected from the FCC, USAC, study participants, and other sources sought to determine how the nature of E-rate policy change, application process change, and funding impacts and influences applicant experiences and their technology. This study addressed three research questions and hopes to inform applicants, policymakers, and stakeholders how to better manage and derive benefit from this funding source.

Chapter 4: Reporting and Analysis

As mentioned in Chapter 3, a preliminary study leading to this research determined how many entities applied for E-rate from 1998 through Funding Year 2017, and how this process might have impacted their diffusion of innovation (Rogers, 2010) spanning nearly two decades. Because hundreds of thousands of participant pools (schools and libraries) have used the E-rate program over the last 20 years, a more pragmatic framework (Creswell, 2012) involving case study was developed. Two Lakota K-8 schools residing on the Pine Ridge Reservation in South Dakota were selected for this case study.

E-rate data was examined to guide both this study and determine the total amount of E-rate funding requests that were made and what the disbursements of those requests were. Examination of this information sought answers of "how" and "why" E-rate influences technology, and hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from the FCC E-rate Program. For reasons of anonymity, this study refers to the research sites as School "A" and School "B."

Data was collected and compared from national, state, and local sources which reflect the E-rate application process, funding commitments, actual funding disbursements, and the human experiences realized or perceived. Data was gathered to help ascertain the very first instance (Funding Year) each of the two schools individually applied for or were connected to a consortium applying for E-rate subsidies since 1998 through Funding Year 2017. The following information is exhaustive and was be examined by E-rate Funding Year:

1. Available E-rate process correspondence and FCC Forms. Obtainable from the applicant (if they obtained records) and the Schools and Libraries Division's many data retrieval tools.

2. Available correspondence and documentation related to the service providers who provided quotes for service and the means of selecting the vendors (Quotes, contracts, emails, bid assessment and selection documents and project documents).
3. Eligible Service List for funding year (changes each year). Obtainable from the Schools and Libraries Division (USAC, 2016p).
4. Copies and outcomes of any Program Integrity Reviews, Audits, Appeals or other documents related to program review (USAC, 2017ag).
5. Status of the applicant's technology infrastructure (switches, servers, bandwidth, LAN and Fiber Cable, Topography, routers, and Child Internet Protection Filtering) at the time of application. This would also include a look at technologies that are not eligible for E-rate discounts such as most software and online learning curriculum. Obtainable from applicant if they maintained a technology plan or records of change.
6. Human interaction with the E-rate process was gained through some personnel involved in each E-rate Funding Year. Personnel interviews included business managers, technology coordinators, principals, state and national coordinators, information managers and service providers.
7. Personal observations conducted at both participant sites, included classrooms, server rooms, network diagrams, cabling, switching, Wi-Fi, Local Area Network, servers, content filtering, and other technology infrastructure.

Data in Simple Form

Data for Funding Years (FY) 1998 through 2015 was initially collected using the Schools and Libraries Division Data Retrieval Tool (USAC, 2018c), commonly known as (DRT). Data after 2015

was initially collected using Automated Search of Commitments (ASC) Tool (USAC, 2019a). Though less comprehensive than the DRT, this data led the research in the same direction.

Once data was collected by FY, it was examined to determine the specific FCC Forms and Funding Request Numbers (FRNs) used or generated for each source examined. FCC Forms were used to determine specifics such as:

- Names of personnel who applied for E-rate subsidies (potential interviewees)
- Initial FRN dollars requested and service provider linkage
- Specific services requested on FCC Form 470
- Specific services and FRN linkage information on the FCC Form 471

Dependent upon FY specifics, initial data and application information led research in varying directions specific to interview questions and onsite query and discovery as noted in Chapter Three.

Data Sources

The three sources pooled from the DRT and ASC were all E-rate applicants in the state of South Dakota, the Bureau of Indian Education (BIE) as a separate entity, and a local Tribal education consortium (Oglala Nation Education Coalition or ONEC) as a separate entity. The South Dakota data revealed every Billed Entity within the state that applied for E-rate in each year; thus, illustrating if School "A" or School "B" applied for E-rate subsidies during each of these years. The BIE and ONEC entities are considered consortiums leaders; if they applied for E-rate, it was likely they included one or both schools in this study. An overview of study schools, BIE and ONEC organizations will follow.

School "A" and School "B." These two entities are tribally-operated schools,

commonly known as Tribal or Grant schools. These schools are either "Tribally controlled under P.L. 93-638 Indian Self Determination Contracts or P.L. 100-297 Tribally Controlled Grant Schools Act (DOI/ED Indian Education Study Group, 2018).

Bureau of Indian Affairs (BIA) and Bureau of Indian Education (BIE). The BIA is the oldest agency of the United States Department of the Interior and is contracted to supply services to Tribal Agencies in all 50 states. Amongst many functions, they provide the Information Network for the BIE and support many of the Network support functions. The BIE is works in parallel with the BIA and provides education services to approximately 42,000 Indian students.

Since the inception of the E-rate Program in 1998, the OIEP/BIE had taken the lead on E-rate Program support, primarily seeking E-rate subsidies using consortium applications to assist BIE-funded schools. In 2005, the OIEP director began working with the BIA Office of the Chief Information Officer (OCIO) to improve technology within the OIEP (BIA, 2007; DOI/ED Indian Education Study Group, 2014). This ultimately led to an agreement that the OCIO and his office would assume responsibility of the OIEP E-rate program (BIA, 2007). The organization that provided this support was called the OCIO E-rate Team. Beginning, in 2017, E-rate Program responsibilities transferred back to the BIE; also known as the BIE E-rate Team.

Oglala Nation Education Coalition (ONEC). According to documents and statements, ONEC is a Tribal entity that maintained partial control over technology planning for its member schools. Though ONEC is still an active entity on the Pine Ridge Reservation, they have not facilitated technology planning or E-rate consortiums since 2006. Therefore, they were guiding technology and facilitating the E-rate application process for their member schools. However, ONEC is not a subordinate organization to the Oglala Sioux Tribe (OST), but rather a

consortium of schools with a board of directors. The OST has their own education department, but sources indicate, they have never had an active planning or governing role in school technology or E-rate support.

Gathering the Data and Initial Review

The DRT and ASC were used to download application specifics using a file format known as comma separated value (CSV). This file format is examined using Microsoft Excel or another spreadsheet software. With the DRT, each year of data extracted included between 50 and 60 column headers within the spreadsheet and multiple E-rate applicants displayed below within the rows of the spreadsheet (Figure 9). The ASC is less detailed but collected data does lead research in the same direction. It is the opinion of the researcher, that this raw data is the nexus of any E-rate study and must be thoroughly examined.

The data is chronological in nature and reveals the history and status of most of the E-rate application processes and forms for a given FY. This linkage helped lead the research in multiple directions, assisting a comprehensive narrative for each FY that School "A" and School "B" applied for E-rate or were members of consortium applications. Data from the DRT is explained in more detail in Appendix A of this study.

This first section of this chapter acts provides an initial review of data gathered from DRT, ASC, FCC Forms 470 and 471, interviews and personal observation from FY 1998 through FY 2017. Following this initial review, the final section of Chapter Four provides a summary of the data linkage to the research questions to further the narrative.

Information is organized by FY, from earliest to most recent. Some reviews include three FYs, and others just one, dependent on the abundance of data of each. Beginning with FY 2008, some data might be further organized by including the activities of planning, application,

utilization and accountability. Additionally, it was necessary to review various histories along the way to provide context in this study.

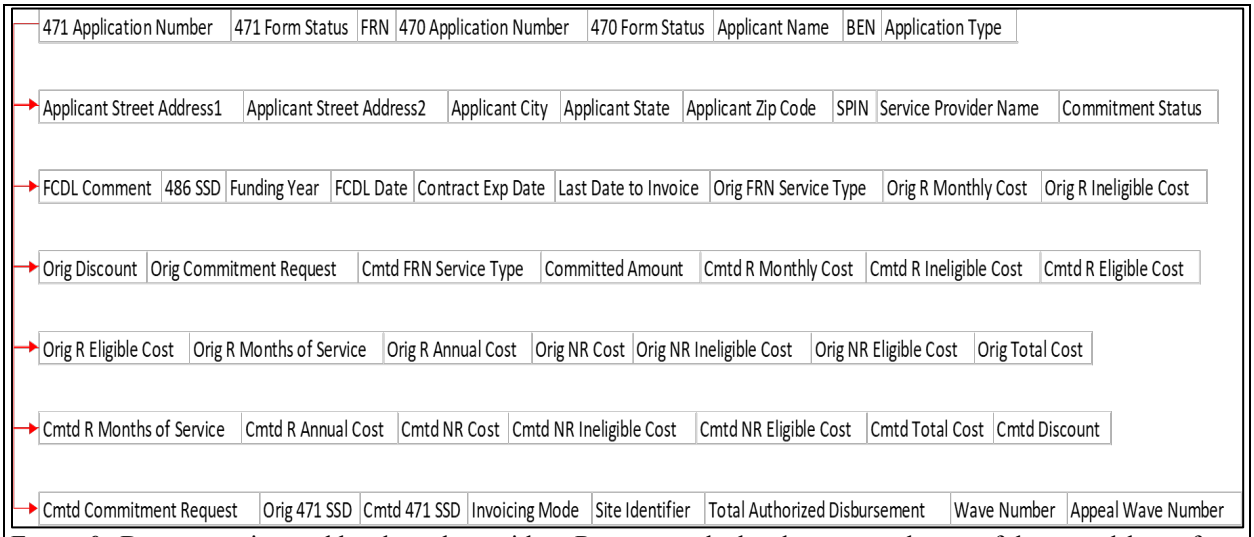


Figure 9. Data extraction tool header column titles. Represents the headers across the top of the spreadsheet after the .csv file is opened. Because the header titles could not be displayed across a typical page of paper, the arrows represent the continuous flow of titles if one viewed the file on a computer screen. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

FYs 1998 through 2000 – E-rate years 1 through 3. The BIE was the only entity that applied for E-rate Program subsidies.

BIE consortium application – FY 1998. The DRT revealed the BIE applied for E-rate subsidies using one FCC Form 470 linked to two FCC Forms 471 (Figure 10). Oddly, the FCC Form 470 was certified, but it did not request any services. However, the DRT shows that the FCC Forms 471 were used to request Internal Connection services (USAC, 2018e). The total pre-discount amount requested was $369,503.14 dollars and the actual amount committed and disbursed was $322,900.43 dollars. The application process approved 58 FRNs and disapproved one FRN. The explanation for the one disapproval, was “The site-specific discount was corrected – funding cap will not provide for Internal Connections less than 70% discount to be

funded" (USAC, 2018c). FCC Forms 471 are unavailable on the DRT until FY 2000, so they could not be reviewed.

Funding Year	FCDL Date	Service Requested	Original Commitment Request	Total FRNs	FRNs Denied	Committed Amount	Total Authorized Disbursement
1998	2/25/1999	Internal Connections	369,503.14	59	1	322,900.43	322,900.43

Figure 10. Portion of BIE FY 1998 DRT results. Represents a summary of the BIE FY 1998 consortium application taken from the DRT. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

After interview with a BIA representative, it became apparent that this consortium only included BIE-operated Schools. His conclusion was that "the BIE was attempting E-rate for the first time; having direct control over BIE-operated schools, they could place these schools on the consortium application" (Personal communication, October 18, 2018).

BIE consortium application – FY 1999. The DRT revealed the BIE applied using one FCC Form 470 linked to 17 FCC Forms 471 (Figure 11). The applications were used to request Internal Connection and Telecom subsidies. (USAC, 2018c). The application process approved 59 FRNs for Internal Connections, 295 FRNs for Telecom, and 42 FRNs for Internet Access. The application process also disapproved 42 FRNs for Internal Connections because 30% or more of each FRN included a request for Satellite Equipment and Service, which was an ineligible product based on program rules (USAC, 2018c).

Data indicates the schools in this study were only included for Telecom service subsidies. Further investigation revealed that of the 32 FRNs receiving disbursement for Telecom, School "A" and School "B" received some portion of those monies (USAC, 2018d).

Funding Year	FCDL Date	Service Requested	Original Commitment Request	Total FRNs	FRNs Denied	Committed Amount	Total Authorized Disbursement	Remarks
1999	11/16/1999	INTERNAL CONNECTIONS	5,855,877.30	101	42	4,522,620.00	918,626.18	Only 13 FRNs received Disbursement
1999	11/16/1999	TELCOMM SERVICES	1,504,103.63	295	0	1,491,991.23	167,903.19	Only 32 FRNs received Disbursement
1999	11/16/1999	INTERNET ACCESS	326,216.67	42	0	311,126.37	0.00	

Figure 11. Portion of BIE FY 1999 DRT results. Represents a summary of the BIE FY 1999 consortium application taken from the DRT. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The total amount requested before discounts was $7,686,197.60 dollars for 438 FRNs. The application process funded $6,325,737.60 dollars for 396 FRNs. Of the funded amount, only $1,086,529.70 dollars were disbursed towards 45 FRNs. Disbursement is equivalent to the E-rate application invoicing process being correctly completed. Without analyzing each funding request, the reason for this large deficit from funded to disbursed cannot be realized. Since this study looks at two schools only, the researcher elected not to pursue a deeper analysis.

It is impossible to depict which FRN belongs to what school. However, it is important to see funding being disbursed for the first time to schools in this study. Further evidence suggests that these monies were used to subsidize existing dial-up Internet Service or partial T-1 service to schools on the Pine Ridge.

BIE consortium application – FY 2000. The DRT revealed the BIE applied using one FCC Form 470 linked to two FCC Forms 471 (Figure 12). The applications were used to request Internet Access and Internal Connections service subsidies.

The application process approved 19 FRNs for Internal Connections and 61 FRNs for Internet Access. The application process also disapproved 18 FRNs for Internal Connections. FCDL comments did not indicate why these FRNs were denied (USAC, 2018c).

Funding Year	FCDL Date	Service Requested	Original Commitment Request	Total FRNs	FRNs Denied	Committed Amount	Total Authorized Disbursement	Remarks
2000	8/18/2000	INTERNAL CONNECTIONS	5,076,114.00	37	18	1,505,199.68	1,505,199.68	
2000	8/18/2000	INTERNET ACCESS	2,258,722.00	61	0	1,905,815.27	1,583,481.87	2 FRNs received no disbursement

Figure 12. Portion of BIE FY 2000 DRT results. Represents a summary of the BIE FY 2000 consortium application taken from the DRT. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The Telecommunications FRNs requested LAN Interconnect Service for up to 176 schools and connected Satellite Service for up to 67 schools. The Internet Access FRNs requested Satellite Access to Internet for up to 67 schools (Wide Area Network for Internet Access) and Unbundled Access for up to 176 schools. The Internal Connections FRNs requested LAN functions that would cable up to 37 schools and Satellite Dishes for up to 76 schools (USAC, 2018c).

The total amount requested before discounts was $7,334,836.00 dollars for 98 FRNs. The application process funded $3,411,014.95 dollars for 80 FRNs. Of the funded amount, only $3,088,681.55 dollars were disbursed towards 58 FRNs.

The telephone area code and prefixes for all schools on the Pine Ridge Reservation were included on the original FCC Form 470 (USAC, 2018d). This indicates an intent to include the schools in this study on the consortium. However, as the application process continued, the data shows that no schools on the Pine Ridge Reservation were included on the FCC Form 471, nor did any of these schools receive any E-rate subsidies (USAC, 2018c, 2018e). The reason for their omittance is assumed to be either that they did not have school level technology plans or did not provided Letters of Agency.

FYs 2001 through 2003 – E-rate years 4 through 6. From E-rate FY 2001 through

2003, the BIE and the ONEC were the only entities linked to this study that applied for E-rate Program subsidies. Each entity will be reviewed for the entire time frame separately. Additionally, a review of some ONEC history will precede the data review.

BIE consortium application – FY 2001. The DRT revealed the BIE applied for E-rate subsidies using three FCC Forms 470. The applications were used to request Internet Access and Internal Connections service subsidies. The first application process approved 64 FRNS for Internet Access and disapproved 175 FRNs for Internal Connections. The reason given for disapproval was in consultation with the applicant (USAC, 2018c). The schools in this study were not included in this application.

The total amount requested before discounts for Internet Access was $1,436,630.94 dollars. From this amount, $1,382,243.74 dollars were disbursed. The total amount requested for Internal Connection discounts was approximately $17.6 million; all monies were denied.

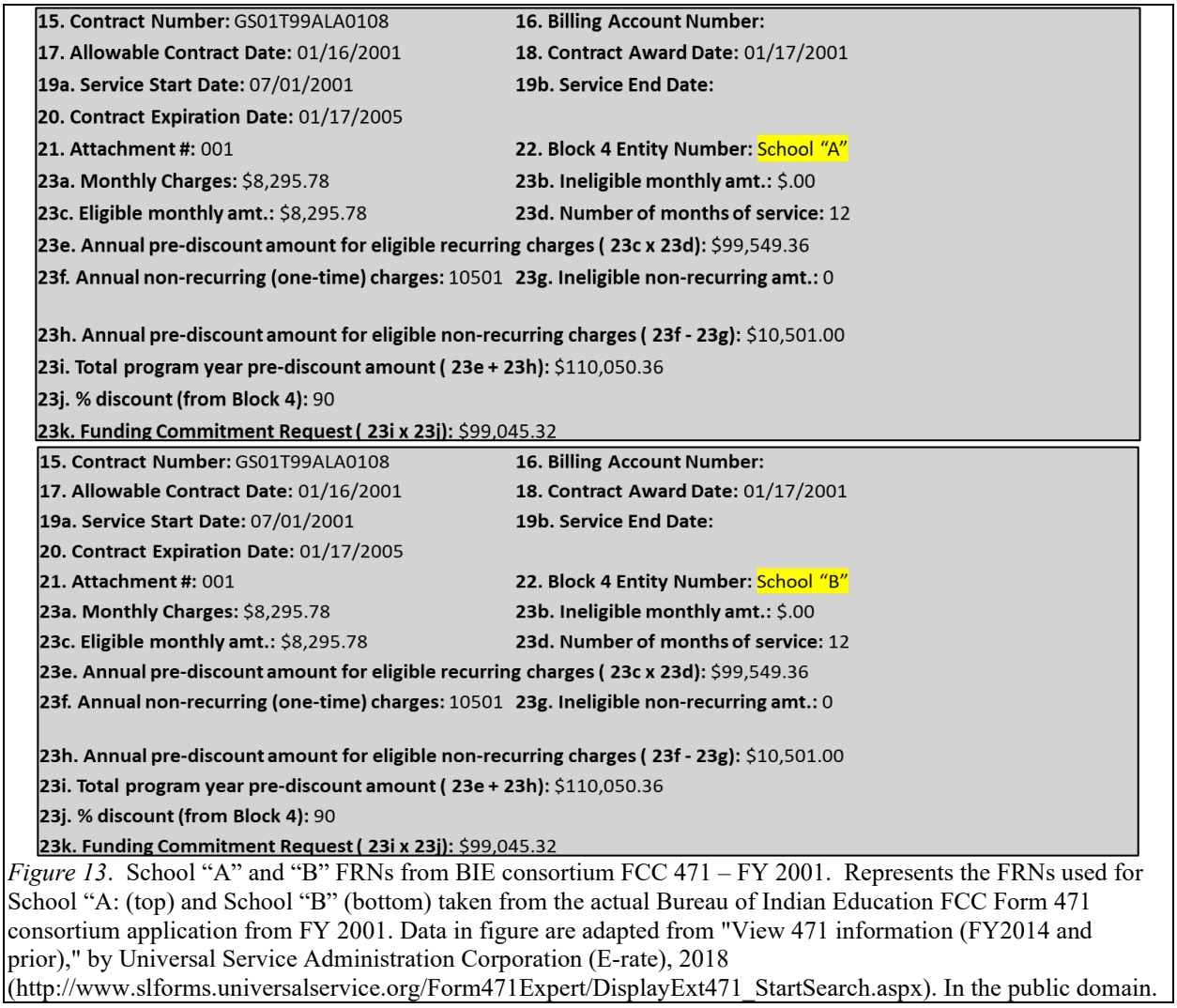
An interview source revealed the disbursed amount of monies for Internet Access above was recalled in 2008 by the Schools and Libraries Division. Though currently under appeal, the latest information suggests (Personal communication):

> USAC Schools and Libraries Division (SLD), by "Notice of Commitment Adjustment Letter," dated June 29, 2007, notified BIE of potential violations of program rules due to allegedly incomplete documentation maintained by the Federal Government and demanded repayment of the entire $1,382,244 provided under the E-rate program…(October 18, 2018)

The above example depicts the possibility of how application process errors can hamper funding success and further reveals the importance of understanding E-rate Program rules.

The second application process requested Basic Maintenance service subsidies. The application process included 175 FRNs and was corrected to Internal Connections subsidies

during the review process. School "A" and School "B" were included, each as a separate FRN requesting discounts of $99,045.32 dollars (Figure 13).



15. Contract Number: GS01T99ALA0108 **16. Billing Account Number:**
17. Allowable Contract Date: 01/16/2001 **18. Contract Award Date:** 01/17/2001
19a. Service Start Date: 07/01/2001 **19b. Service End Date:**
20. Contract Expiration Date: 01/17/2005
21. Attachment #: 001 **22. Block 4 Entity Number:** School "A"
23a. Monthly Charges: $8,295.78 **23b. Ineligible monthly amt.:** $.00
23c. Eligible monthly amt.: $8,295.78 **23d. Number of months of service:** 12
23e. Annual pre-discount amount for eligible recurring charges (23c x 23d): $99,549.36
23f. Annual non-recurring (one-time) charges: 10501 **23g. Ineligible non-recurring amt.:** 0
23h. Annual pre-discount amount for eligible non-recurring charges (23f - 23g): $10,501.00
23i. Total program year pre-discount amount (23e + 23h): $110,050.36
23j. % discount (from Block 4): 90
23k. Funding Commitment Request (23i x 23j): $99,045.32

15. Contract Number: GS01T99ALA0108 **16. Billing Account Number:**
17. Allowable Contract Date: 01/16/2001 **18. Contract Award Date:** 01/17/2001
19a. Service Start Date: 07/01/2001 **19b. Service End Date:**
20. Contract Expiration Date: 01/17/2005
21. Attachment #: 001 **22. Block 4 Entity Number:** School "B"
23a. Monthly Charges: $8,295.78 **23b. Ineligible monthly amt.:** $.00
23c. Eligible monthly amt.: $8,295.78 **23d. Number of months of service:** 12
23e. Annual pre-discount amount for eligible recurring charges (23c x 23d): $99,549.36
23f. Annual non-recurring (one-time) charges: 10501 **23g. Ineligible non-recurring amt.:** 0
23h. Annual pre-discount amount for eligible non-recurring charges (23f - 23g): $10,501.00
23i. Total program year pre-discount amount (23e + 23h): $110,050.36
23j. % discount (from Block 4): 90
23k. Funding Commitment Request (23i x 23j): $99,045.32

Figure 13. School "A" and "B" FRNs from BIE consortium FCC 471 – FY 2001. Represents the FRNs used for School "A: (top) and School "B" (bottom) taken from the actual Bureau of Indian Education FCC Form 471 consortium application from FY 2001. Data in figure are adapted from "View 471 information (FY2014 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form471Expert/DisplayExt471_StartSearch.aspx). In the public domain.

The 175 FRNs requesting Internal Connections subsidies totaling 17.4 million dollars. All 175 FRNs were denied in consultation with the applicants; no other reason was given (USAC, 2018c).

The third FCC Form 470 was linked to one FCC Form 471 and requested Internal Connections for one school. Neither of the two schools in this study were included on this application.

BIE consortium application – FY 2002. The DRT revealed the BIE applied for E-rate subsidies using one FCC Forms 470 (Figure 14). The applications were used to request Telecommunications, Internet Access and Internal Connections service subsidies. The application process disapproved one FRN for Internal Connections, 61 FRNs for Internet Access and 175 FRNs for Telecom services. All funding requests were denied because every school within the consortium lacked an approved technology plan (USAC, 2018c). Prior to FY 2014, all school requesting E-rate services accept telephone discounts, were required to have an approved technology plan (USAC, 2016e).

Funding Year	FCDL Date	Service Requested	Original Commitment Request	Total FRNs	FRNs Denied	Committed Amount	Total Authorized Disbursement
2002	10/28/2003	INTERNAL CONNECTIONS	15,917,571.00	1	1	0.00	0.00
2002	4/21/2005	INTERNET ACCESS	4,517,439.03	61	61	0.00	0.00
	4/21/2005	TELECOM SERVICES	3,767,691.48	175	175	0.00	0.00
			24,202,701.51				

Figure 14. Portion of BIE FY 2002 DRT results. Represents a summary of the BIE FY 2002 consortium application taken from the DRT. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

This BIE consortium application attempted to facilitate a large upgrade across the country; as quoted from this FCC Form 470 (USAC, 2018d):

> BIA OIEP is looking for telecommunication services (T-1 circuits to provide LAN Interconnect Services) to connect the, up to 186, schools spread across 27 states to one of the six centralized locations where Internet Access connection will be provided. BIA OIEP is also requesting someone to provide this Internet Access from six locations to where the schools have been linked. BIA is also looking to upgrade the LAN infrastructure at up to 80 of their schools spread across 27 states. Upgrades include new servers, new software (E-mail and/or Windows 2000 server), new drops, and extension of LAN cable plant to new building/classrooms. (p. 3)

The BIE made 242 separate funding requests for the schools within the BIE during the 2002 Funding year. These requests asked for subsidies totaling 24 million dollars. The amount

requested for School "A" and School "B" could not be extrapolated from the data, but it included services for Telephone, Internet, Internal Connections and Basic Maintenance of Internal Connections. The assumption is that each school lost subsidies worth over $200,000 dollars.

BIE consortium application – FY 2003. The DRT revealed the BIE applied for E-rate subsidies using three FCC Forms 470. The applications were used to request Telecommunications, Internet Access and Internal Connection service subsidies for over 200 sites within the BIE (USAC, 2018c). The application process disapproved 194 FRNs for Internal Connections, 28 FRNs for Internet Access and 208 FRNs for Telecom services. Internal Connections and Internet Access FRNs were denied in consultation with the applicants and Telecom Services FRNs were denied "A contract for a new service was signed prior to the required 28-day waiting period computed from the date of the posting of the Form 470 to the SLD Web Site" (USAC, 2018c, p. 1).

The schools in this study were included on all applications. In total, the BIE made 430 separate funding requests totaling in excess of $27.4 million, and each FRN was left unfunded. The amount requested for School "A" and School "B" could not be extrapolated. The assumed financial subsidies lost to School "A" and School "B" was approximately $200,000 dollars each. This number was determined by dividing the total of 430 funding requests ($27.4 million) by the schools included on the consortium applications.

This concludes the BIE consortium data for FYs 2001 through 2003 – E-rate Years 4 through 6. The following data will review some ONEC history and ONEC consortium data for FYs 2001 through 2003.

ONEC – Background into illicit service providers. Before examining the

ONEC applications, some background information is necessary to provide context into the study. A former administrative member of the Pine Ridge Education Center was briefly interviewed, and she explained there was some concern over an E-rate dilemma near the "2003 time-frame" that involved ONEC, Service Providers and the Department of Justice. She mentioned an investigation involved allegations against the service providers that ONEC selected for E-rate services. She remembered few details but did emphasize that the incident gave E-rate a bad reputation on the Pine Ridge Reservation and that most schools became doubtful of the program. "Even then, most schools began depending on the Education Line Office or the BIE to assist them with E-rate after that incident" (Personal communication, July 10, 2018). She recalled, ONEC quit applying as a consortium for schools around that time, and it took great effort to convey continued interest until after the 2007 FY.

Further investigation revealed the source document surrounding the court case involving several service providers and ONEC. According to documentation (FCC, 2007).

> On April 20, 2006, NextiraOne pled guilty to and was subsequently convicted of federal wire fraud in violation of 18 U.S.C. § 1343 for activities in connection with its participation in the E-rate program with the Oglala Nation Education Coalition ("ONEC") schools on the Pine Ridge Reservation in South Dakota.18 The activities that led to NextiraOne's conviction took place from at least December 2000 to at least December 2002, and thus involved both NextiraOne and its predecessor, WCS.19 Among other things, NextiraOne or WCS: (1) falsely promised ONEC schools that they could participate in the E-rate program for free; (2) guided ONEC in submitting E-rate applications to USAC that contained non-competitive manufacturer "list" prices; (3) billed USAC for equipment specified that had not been delivered; and (4) billed USAC for an item not eligible for E-rate support, and also made it appear that NextiraOne had billed ONEC for the non-discounted portion of equipment and services funded by E-rate when in fact it had not. As a result of its fraudulent conduct, NextiraOne over-billed the E-rate program in excess of $1 million. (p. 3)

The source used for this incident is one of many existing on the World Wide Web. It seems reasonable to assume, existing or potential E-rate applicants on the Pine Ridge Reservation were

victims of fraudulent E-rate practices. This could have resulted in local apprehension and less than positive interest towards the FCC E-rate Program.

ONEC consortium application – FY 2001. The DRT revealed ONEC filed for E-rate subsidies using FCC Form 470 linked to three FCC Forms 471 (Figure 15). The applications were used to request Telecommunications and Internal Connection service subsidies. Schools "A" and "B" were included on these consortium applications.

The application process funded five FRNs for Internal Connections and one FRN for Telecom (Internet Access). The total amount requested before discounts for Internet Access was $229,964.01 dollars. From this amount, $21,030.20 dollars were disbursed. The total amount requested for Internal Connection discounts was From this amount, $1,205,192.50 dollars were disbursed

Funding Year	Commitment Status	FCDL Comment	FCDL Date	Orig FRN Service Type	Orig Commitment	Committed Amount	Total Authorized Disbursement
2001	FUNDED	The dollars requested were reduced to remove: the ineligible product(s)/service(s) RAN console, NAS/VNS. voicemail cable, SEB II, network engineering and per diem.	1/25/2002	INTERNAL CONNECTIONS	$426,420.40	$351,010.55	$0.00
2001	FUNDED		1/25/2002	TELCOMM SERVICES	$229,964.01	$229,964.01	$21,031.20
2001	FUNDED	The dollars requested were reduced to remove: the ineligible product(s)/service(s) Greet and Guide, workstation licenses, installation, shipping and support.	10/31/2001	INTERNAL CONNECTIONS	$678,433.50	$658,488.60	$208,558.57
2001	FUNDED	The dollars requested were reduced to remove: the ineligible products maintenance on RAN, NAS/VNS, SEBII, MAT, Class software, NMS, and remote services.	10/31/2001	INTERNAL CONNECTIONS	$217,582.63	$160,098.77	$50,706.98
2001	FUNDED	The estimated charge was changed to reflect the documentation provided. The dollars requested were reduced to remove: the ineligible products RAN, NAS/VNS, SEBII, MAT, Class software, NMS.	10/31/2001	INTERNAL CONNECTIONS	$1,510,533.41	$690,852.91	$195,146.36
2001	FUNDED	The dollars requested were reduced to remove: the ineligible product(s)/service(s) monitoring.	10/31/2001	INTERNAL CONNECTIONS	$2,478,910.32	$2,370,463.33	$750,780.59

Figure 15. Portion of BIE FY 2001 DRT results. Represents a portion of the ONEC DRT information. It demonstrates six funding requests and amounts committed and disbursed for FCDL approval for FY 2001. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Retrieving explanations for E-rate processes this early in the history of E-rate has proved difficult. Both personnel and archived records have proven unavailable. Though disbursement rates were less than nominal, the ONEC's funding allowed the schools on this consortium application to receive a telephone system. Technology Plans for School "A" and School "B" indicate they both received telephone infrastructure with this funding. The phone system installed in these schools was Nortel based and connected through a private network managed from a central location offsite from the schools.

ONEC consortium application – FY 2002. The DRT revealed ONEC applied for E-rate subsidies using one FCC Form 470. The applications requested every service discount available at that time (USAC, 2018c). For reasons unknown, when ONEC filed their FCC Forms 471, only Internal Connections subsidies were included. ONEC used the same service provider from Funding year 2001 involved in the Department of Justice legalities.

The application process denied 31 FRNs for Internal Connection services. The justification given was that the consortium leader could not show authority to request services on behalf of the entities through Letters of Agency, and ONEC could not demonstrate access to the funds needed to pay their portion of the charges (USAC, 2018c). These requests asked for subsidies totaling 4.3 million dollars. The schools in this study were included on this application. The assumed financial subsidies lost to School "A" and School "B" was approximately $366,250 dollars each. This number was determined by dividing the total of 31 funding requests (4.3 million dollars) by the 12 schools included on the consortium applications.

ONEC consortium application – FY 2003. The DRT revealed ONEC applied E-rate subsidies using one FCC Form 470 linked to three FCC Forms 471. The applications requested Telecommunications, Internet Access and Internal Connection service subsidies (USAC, 2018c).

The applications included 25 entities on the Pine Ridge Reservation and requested 75 FRNs totaling $10.5 million dollars. Each of these funding requests were denied either for consultation with the applicant or the consortium leader could not demonstrate access to funds for their portion of the services (USAC, 2018c).

The assumed financial subsidies lost to School "A" and School "B" was approximately $420,000 dollars each. This number was determined by dividing the total of 31 funding requests ($10.5 million) by the 25 entities included on the consortium applications.

This concludes the ONEC consortium data for FYs 2001 through 2003 – E-rate Years 4 through 6. The following data will review FY 2004 or E-rate Year 7.

FY 2004 (July 1, 2004 through June 30, 2005) – E-rate year 7. During this window of time, School "A" applied for E-rate program service subsidies. School "B" partially applied for E-rate program service subsidies. The BIE and the ONEC applied for E-rate program service subsidies using the consortium process. Each entity will be reviewed separately for FY 2004.

School "A" E-rate application – FY 2004. The DRT revealed School "A" applied for Telecommunications and Internet Access subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c). Although, the FCC Form 470 used by School "A" requested subsidies for Telephone service (basic telephone and cellular) and Internet Access, the FCC Form 471 and DRT reflected the school only selected services under local and long-distance telephone service (AKA Plain old Telephone or POTS). Figure 16 shows the School "A" request section from the FCC Form 470 (USAC, 2018d).

Telecommunications Services

Service or Function:	Quantity and/or Capacity:
DS3 Line	1
T1 Line	1
POTS	12
Cell Phones	10

Internet Access

Service or Function:	Quantity and/or Capacity:
DS3 Line	1
T1 Line	1
POTS	12
Cell Phones	10

Figure 16. Portion of School "A" FY 2004 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications and Internet access. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

The DRT reflects that the school requested and received funding for discounts totaling $37,584 dollars. However, the amount disbursed only reflected $18,279.79 dollars (USAC, 2018c). The FCDL comments in the DRT did not reflect a PIA or cost adjustments. The discrepancy between amount funded and amount disbursed could not be determined. The individual responsible for this application could not be contacted for interview.

This concludes the School "A" application data for FY 2004 or E-rate Year 7. The following data will review School "B" FY 2004 application data.

School "B" E-rate application – FY 2004. The DRT revealed no data on School "B" for FY 2004 (USAC, 2018c). Review of the FCC Form 470 download tool (Figure 17) indicated the school applied for Priority I and Priority II E-rate subsidies for telephone discounts and Internal Connections (USAC, 2018d). However, they did not file an FCC Form 471 requesting funding commitments. No further data was available onsite or through the OCIO E-rate Team.

Telecommunications Services

Service or Function:	Quantity and/or Capacity:
digital trnasmission ds3	1 DS3 line
POTS	12 trunklines
cell phones	15
long distance	1
fax lines	4
DS3 T1	1

Internal Connections

Service or Function:	Quantity and/or Capacity:
servers	2
UPS	2
wireless	6 access point
e-mail server	1

Figure 17. Portion of School "B" FY 2004 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications and internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

This concludes the School "B" application data for FY 2004 or E-rate Year 7. The following data will review the BIE consortium data for FY 2004.

BIE consortium application – FY 2004. The DRT revealed the BIE applied for E-rate subsidies using five FCC Forms 470 (USAC, 2018c). The applications were used to request Telephone, Internet Access, Email, and Internal Connections service subsidies. The schools in this study were not included on any of the FCC Form 471 applications. However, they were included on three of the FCC Forms 470 for Telephone and Internal Connections discounts. Several reasons could have caused their absence on the FCC Form 471; likely, a Letter of Agency was not provided from the schools or an approved technology plan was not active for the schools in the study. Factual data for their absence could not be found.

The application process denied funding for Five FRNs totaling $26,594,583.56 dollars either because the consortium leader failed to provide evidence of authority to file Forms 471 on behalf of consortium entities or the request contained ineligible entities (USAC, 2018c).

This concludes the BIE consortium data for FY 2004. The following data will review the ONEC consortium data for FY 2004.

ONEC consortium application – FY 2004. The DRT revealed the ONEC entity changed its name to the Oglala Lakota Technology Consortium. ONEC applied for E-rate subsidies using one FCC Form 470 (USAC, 2018c). The applications requested Internet Access and Internal Connection service subsidies for 11 schools on the Pine Ridge Reservation and one school that was off the reservation. The schools in this study were included on both funding requests. The application process denied funding for two FRNs totaling $288,000 dollars because ONEC could not verify eligibility of any of the services requested (USAC, 2018c).

The assumed financial subsidies lost to School "A" and School "B" was approximately $24,000 dollars each. This number was determined by dividing the total of both FRNs ($288,000 dollars) by the 12 entities included on the consortium applications.

FY 2005 (July 1, 2005 through June 30, 2006) – E-rate year 8. During this window of time, School "A" did not apply for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE and the ONEC applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2005.

School "B" E-rate application – FY 2005. The DRT revealed School "B" applied for E rate subsidies using one FCC Form 470. The application requested Telecommunications, Internet Access, and Basic Maintenance of Internal Connection service subsidies (USAC, 2018c). Figure 18 depicts the School "B" request section from the FCC Form 470 (USAC, 2018d). Though the school requested three services, the DRT and FCC Form 471 reflected the school only selected services under local and long-distance telephone service and Internal Connections (USAC, 2018e).

Why they only filed an FCC Form 471 for basic telephone and Internal Connections is unknown. The contact person on the applications was unavailable for interview. Additionally, the school applied for Basic Maintenance under the category of Internal Connections but filed for Internal Connections on the FCC Form 471. This was likely an oversite, but it would normally cause the Schools and Libraries Division to send in review questions to clarify.

The DRT reflects School "B" requested funding for Internal Connection subsidies totaling $4,716 dollars and Telephone subsidies totaling $15,676.63 dollars (USAC, 2018c). They were denied funding for both funding requests because they did not provide enough documentation to determine the eligibility of the discounted items. This may be because the school did not respond or incorrectly responded to a Program Integrity Review questionnaire.

Telecommunications Services

Service or Function:	Quantity and/or Capacity:
pots	17
local long distance phone service	for 1 school
digital transmission services	1 ds3
diigital transmission services	T1
Cell Phones	10

Internet Access

Service or Function:	Quantity and/or Capacity:
E-MAIL HOSTING	TO ACCOMMODATE 1 SCHOOL
WEB HOSTING	TO ACCOMMODATE 1 SCHOOL
T-1 ACCESS	TO ACCOMMODATE 1 SCHOOL
DS3 ACCESS	TO ACCOMMODATE 1 SCHOOL
INTERNET SERVICE (ACCESS TO INTERNET)	TO ACCOMMODATE 1 SCHOOL

Internal Connections

Service or Function:	Quantity and/or Capacity:
PBX WIRING AND MAINTENANCE	TO ACCOMMODATE 1 SCHOOL
FIBER MAINTENANCE	TO ACCOMMODATE 1 SCHOOL
KEY SYSTEM MAINTENANCE	TO ACCOMMODATE 1 SCHOOL
SERVER MAINTENANCE	TO ACCOMMODATE 1 SCHOOL
HUB MAINTENANCE	TO ACCOMMODATE 1 SCHOOL
T-1 ACCESS	TO ACCOMMODATE 1 SCHOOL

Figure 18. Portion of School "B" FY 2005 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications, Internet Access, and internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

This concludes the School "B" application data for FY 2005 or E-rate Year 8. The following data will review the BIE consortium data for FY 2005.

BIE consortium application – FY 2005. The DRT (Figure 19) revealed the BIE applied for E-rate subsidies using two new FCC Forms 470 consortium applications; the first linked to one FCC Form 471, and the latter linked to two FCC Forms 471 (USAC, 2018c). The first application requested discounts for email service that the BIE was using for its schools to communicate. The second FCC Form 471 requested services for Internet Access circuits for all 185 of its schools and for three separate hubs that provided CIPA filtering for the circuits linked to each school. The schools in this study were included on the request for Internet circuit and Email discounts.

Funding Year	FCDL Date	Service Requested	Original Commitment Request	Total FRNs	FRNs Denied	Committed Amount	Total Authorized Disbursement	FCDL Comments
2005	1/25/2006	INTERNET ACCESS	$484,000.00	1	1	0.00	0.00	FRN canceled in consultation with the applicant.
2005	2/15/2006	INTERNET ACCESS	$133,507.12	1	1	0.00	0.00	During application review, you were asked to provide all bids associated with this funding request and you were unable to do so.
2005	1/18/2010	TELCOMM SERVICES	$1,645,112.52	1	1	0.00	0.00	FRN canceled in consultation with the applicant.
			2,262,619.64					

Figure 19. Portion of BIE FY 2005 DRT results. Represents a summary of the BIE FY 2005 consortium application taken from the DRT. It demonstrates three funding requests and amounts committed and disbursed for FCDL approval for FY 2005. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The application process denied funding for three FRNs totaling $2,262,619.64 dollars. The Email and CIPA Hubs were denied in consultation with the applicant, which could be for several unknown reasons. The Internet circuit funding request was denied because the consortium leader was unable to verify the bid selection process for the contract for services (USAC, 2018c).

The amount requested for School "A" and School "B" could not be extrapolated from the data. The assumed financial subsidies lost to School "A" and School "B" was approximately $11,508 dollars each. This number is derived by dividing the total amount of FRNs ($2,262,619.64 dollars) by the 185 schools on the consortium applications.

This concludes the BIE consortium data for FY 2005. The following data will review the ONEC consortium data for FY 2005.

ONEC consortium application – FY 2005. The DRT revealed the ONEC entity maintained its name to the Oglala Lakota Technology Consortium. ONEC applied for E-rate subsidies using one FCC Form 470. The application requested for Telecommunications and Basic Maintenance service subsidies. The FCC Form 470 lists the request as telephone circuits and a telephone hub that would connect the schools on Pine Ridge (USAC, 2018c). Originally, both schools in this study were included on the FCC Form 470 (USAC, 2018d) but only School "B" was included on the FCC Form 471 (USAC, 2018e).

The applications approved funding for the telephone circuit FRN totaling $11,067.84 dollars and the Basic Maintenance FRN totaling $5,570.82 dollars. However, no monies were ever disbursed (USAC, 2018c). The reason for zero disbursement of funds could not be discovered. No one from that FY was available for interview and no additional documentation could be gathered. Of the original 12 schools on the FCC Form 470, five remained on the FCC Form 471. The assumption is the financial subsidy lost to School "B" was worth approximately $3,500 dollars. This number is derived by dividing the total amount of both funding requests by five schools.

This concludes the ONEC consortium data for FY 2005 or E-rate Year 8. The following data will review FY 2006 or E-rate Year 9.

FY 2006 (July 1, 2006 through June 30, 2007) – E-rate year 9. During this window of time, School "A" did not apply for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE and the ONEC applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2006.

School "B" E-rate application – FY 2006. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470 (Figure 20). The application requested discounts for Telecommunications, Internet Access, and Basic Maintenance of Internal Connection service subsidies (USAC, 2018c). Though the school requested three services, the DRT and FCC Form 471 reflected the school only selected services under local and long-distance telephone service (USAC, 2018e). Further evidence suggests the school attempted to finalize additional services on another FCC Form 471 (Basic Maintenance and Internet Access). However, an email from the BIE dated 11/24/2006 indicates School "B" lost $60,449.73 dollars of Category Two (Formally Priority I) funding because the "FCC Form 471 was certified outside of the allowed timeframe window" (Personal Communication, November 2, 2018).

Note: The DRT only provides data for FCC Forms 471 that were certified inside the window. If they are certified outside the window, a waiver must be filed with the FCC with a justification. The submitting window waiver requests section states (USAC, 2017ac):

> You must certify your FCC Form 471 by the close of the application filing window. If you certify your form after this date, it will be considered out-of-window and you are unlikely to receive funding. FCC Forms 471 certified after the close of the application filing window will be put in an out-of-window status and will not be reviewed by USAC. For USAC to move these applications to an in-window status, the applicant must request – and the Federal Communications Commission (FCC) must grant – a waiver of the filing window deadline. (Para. 6)

If the FCC waiver to file out of window is approved, the applicant receives certification for the FCC Form 471. At that time, the data becomes available on the DRT. This case indicates that a

waiver was not applied for and the FCC Form 471 was lost in cycle. The contact person on the applications was unavailable for more specific details.

Telecommunications Services

Service or Function:	Quantity and/or Capacity:
Local Service	4 PRI lines, 4 fax lines, 10 1BF lines, DID lines 18
Long Distance	4 PRI lines, 4 fax lines, 10 1BF lines DID lines 18
Cell Service	18 existing & 2 new
ATM	I Circuit

Internet Access

Service or Function:	Quantity and/or Capacity:
Internet Access Connections	128 connections at T1
e-mail software and licenses	200 accounts
Domain Registry	1 School
Web Hosting	1 School

Basic Maintenance of Internal Connections

Service or Function:	Quantity and/or Capacity:
Basic 5x8x5 Router Maintenance	2 Cisco
Basic 5x8x5 Switch Maintenance	4 Nortel Switchs
Basic 5x8x5 PBX Maintenance	1 Nortel 12x20
Basic 5x8x5 Server Maintenance	1 Mac Server
Basic 5x8x5 Voice Mail Maintenance	1 Nortel Voice, 10 boxes

Figure 20. Portion of School "B" FY 2006 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications, Internet access, and basic maintenance of internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

The DRT (Figure 21) reflects School "B" requested funding Telephone discounts totaling $25,559.60 dollars. They were funded for the entire amount; however, they received zero disbursed dollars. Additionally, the Funding Commitment Decision letter (FCDL) date of 12/24/2008, was issued over a year after FY 2006 ended on 06/30/2007.

The FCDL was issued with an "Appealed Wave Number" of 60R (USAC, 2018b). An appealed wave number indicates "the FRN was appealed, the appeal wave number in which the revised funding decision was issued after the actual funding year" (USAC, 2018b, p. 2). This indicates the FRN received an approved appeal, but a reason for the appeal was not revealed

during this study. The fact that no monies were disbursed indicates that a reimbursement process was likely not initiated.

471 Application Number	471 Form Status	FRN	470 Application Number	470 Form Status	Commitment Status	FCDL Comment
Redacted	CERTIFIED	Redacted	Redacted	CERTIFIED	FUNDED	MR1: The FRN was modified from a non-recurring charge of $12,746.36 to a non-recurring charge of $0.00 and from a monthly charge of $3975.30 to $2366.63 per month to agree with the applicant documentation.

Funding Year	FCDL Date	Contract Exp Date	Last Date to Invoice	Cmtd FRN Service Type	Committed Amount	Cmtd R Monthly Cost	Cmtd R Ineligible Cost
2006	12/24/2008	6/30/2007	4/23/2009	TELCOMM SERVICES	$25,559.60	$2,366.63	$0.00

Cmtd R Eligible Cost	Cmtd R Months of Service	Cmtd R Annual Cost	Cmtd Total Cost	Cmtd Discount	Cmtd Commitment Request	Invoicing Mode	Total Authorized Disbursement	Wave Number
$2,366.63	12	$28,399.56	$28,399.56	90	$25,559.60	NOT SET		60R

Figure 21. Portion of School "B" FY 2006 DRT. Represents a portion of the DRT information for School "B" for FY 2006. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

When an applicant requests services for month-to-month services (such as telephone), they are still obligated to pay for these services as billed by the local telephone company. In this case, School "B" would have paid for telephone service from 1 July 2006 through June 30, 2007. When the FCDL was issued in December 2008, the school would have been required to initiate FCC Form 472 (BEAR), to have the discounted monies returned to them (USAC, 2017ak).

This concludes the School "B" application data for FY 2006 or E-rate Year 9. The following data will review the BIE consortium data for FY 2006.

BIE consortium application – FY 2006. The DRT revealed the BIE applied for E-rate subsidies using two FCC Forms 470. The applications requested discounts for T-1 broadband service subsidies for 175 BIE schools and Internet Access circuit, Internal Connections, and Basic Maintenance service subsidies for the three separate hubs that provided CIPA filtering for the circuits linked to each school. The schools in this study were included on the request for

Internet circuit subsidies. The application process denied all three requests for reasons indicated in Figure 22.

The amount requested for School "A" and School "B" could not be extrapolated from the data, but it included Internet circuit subsidies totaling $1,816,968.10 dollars. The assumption is the financial subsidies lost to School "A" and School "B" were worth over $10,382.67 dollars each. This number is derived by dividing the total amount ($1,816,968.10 dollars) by 175 schools (USAC, 2018c).

Commitment Status	FCDL Comment
NOT FUNDED	were reduced to remove the ineligible residential/dormitory entities and because some Letters of Agency did not describe the services covered by the LOA. <><><><><> DR1: FCC Rules require applicants to retain all documentation regarding the competitive bidding process. You were asked how you selected the service provider for this FRN off of the GSA schedule. You have indicated that you do not have the information to demonstrate how you selected between the multiple vendors available on the GSA contract. Therefore, the FRN is denied.
NOT FUNDED	MR1: At the applicant's request, some entities were withdrawn. <><><><><> MR2: Some entities were removed because not all Letters of Agency or other documentation authorizing the filing of the Form 471 authorized the services requested on the Form 471. <><><><><> MR3: The shared discount was reduced to a level that could be validated by third party data. <><><><><> DR1: FCC Rules require applicants to retain all documentation regarding the competitive bidding process. You were asked how you selected the service provider for this FRN off of the GSA schedule. You have indicated that you do not have the information to demonstrate how you selected between the multiple vendors available on the GSA contract. Therefore, the FRN is denied.
NOT FUNDED	Funding was denied because a substantial number of the Letters of Agency or other documentation authorizing the filing of the Form 471 did not authorize the services requested on the Form 471.

Figure 22. Portion of BIE FY 2006 DRT. Represents a portion of the DRT information for the BIE. It demonstrates three funding requests and reasons for FCDL denial for FY 2006. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

This concludes the BIE consortium data for FY 2006. The following data will review the ONEC consortium data for FY 2006.

ONEC consortium application – FY 2006. The DRT revealed applied for E-rate subsidies using one FCC Form 470 linked. The application requested discounts for Internet circuits and Basic Maintenance for a telephone hub that would connect some the schools on Pine Ridge. Neither school in this study were included on this application. Additionally, ONEC was

denied funding for both funding requests because they could not provide documentation proving eligibility for services requested (USAC, 2018c).

According to research, this was the last year ONEC filed for E-rate services (USAC, 2018c). According to documentation (FCC, 2007), April 2006 was also the period when the Department of Justice legalities between ONEC and fraudulent Service Providers were settled. The assumption is ONEC's motivation and interest in the E-rate Program was never reignited.

This concludes the ONEC consortium data for FY 2006 or E-rate Year 9. The following data will review FY 2007 or E-rate Year 10.

FY 2007 (July 1, 2007 through June 30, 2008) – E-rate year 10. During this window of time, School "B" was the only entity that applied for E-rate program service subsidies.

School "B" E-rate application – FY 2007. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470. The application requested discounts for Telecommunications service subsidies (USAC, 2018c). The application process approved funding for two FRNs for Local and Long-Distance service totaling $14,509.91 dollars and Cellular Phone service totaling $8,311.36 dollars. They were funded under the first funding wave of the year and received one hundred percent of their funding in disbursements (USAC, 2018c).

This concludes the School "B" application data for FY 2007 or E-rate Year 10. The following section will review some history of the BIA and BIE that helps complete a story of what happened between 2005 and 2009. Following this section, review of data will continue with FY 2008.

History of improved BIA E-rate support – 2005 through 2009). According to interviews, since the inception of the E-rate Program in 1998, the OIEP/BIE had taken the lead on E-rate Program support. Until, 2007, they had focused efforts on consortium applications to assist BIE-funded schools. The data thus far resulted in minimal gains and most of their subsidy requests had been denied or largely reduced. After eight years into the E-rate program, these slight gains guided the OIEP and the BIA to reorganize their efforts towards E-rate support.

In 2005, the Office of Indian Education Programs (OIEP) director began working with the Bureau of Indian Affairs (BIA) Office of the Chief Information Officer (OCIO) to improve technology within the OIEP (BIA, 2007; DOI/ED Indian Education Study Group, 2014). This ultimately led to an agreement that the OCIO and his office would assume responsibility of the OIEP E-rate program (BIA, 2007). This resulted with further changes and new information was written into the BIE Master Technology Plan for 2007 – 2010 as (BIA, 2007):

> The additional technology resources and knowledge provided by OCIO has helped to improve the performance of the BIE eRate program. School year 2006‐2007 was a record year for BIE with 101 of the 184 BIE‐funded schools applying for eRate funds. BIE and OCIO are also embarking on a significant technology assessment for selected schools so that a comprehensive plan can be developed to address the needs of individual schools. The individual school plans will become the basis for individual School Technology Plans. This approach will ensure that school plans are synchronized with BIE‐validated needs. (p. 44)

This new Master technology Plan was written in a joint effort between the BIE and the BIA OCIO group. Amongst many other objectives, this plan directed the OCIO to increase its emphasis to BIE-funded school E-rate support for Fiscal Year 2008 and beyond. This support would include assistance to schools for (BIA, 2007):

- Technology planning
- E-rate applications and other processing forms
- Program Integrity Assurance (PIA) reviews and audits

• Records management

• Contracts

This plan recognized that "many schools have difficulty with the significant administrative burden that accompanies participating in the eRate Program" (BIA, 2007, p. 45). The OCIO was also tasked with increasing its support with assisting schools with "writing technology plans, monitoring deadlines, storage of important documents/artifacts, and PIA reviews and audits" (BIA, 2007, p. 45).

Improving support and leadership. In 2007, a technical employee at one of the larger BIE-funded schools on the Pine Ridge Reservation was tasked to assist that school with E-rate. Like other Pine Ridge schools, they had little success with E-rate subsidies. During E-rate FY 2007, this tasking enabled the school to secure E-rate funding exceeding $900,000 dollars for a full campus network upgrade. This success led to a visit from the BIA Office of Information Technology and several members of their E-rate team. The visit resulted with increased emphasis on the E-rate program on Pine Ridge and with the "detail employment" of this technical employee to the Pine Ridge Education Line Office (ELO).

According to interview, the ELO is responsible for overseeing education and support to the seven BIE-funded schools on Pine Ridge. Over the next two years, under the supervision of the Pine Ridge ELO and with assistance from the OCIO E-rate Team, this technical employee assisted every school on Pine Ridge with successful E-rate funding.

According to documents and interview, in the Winter of 2009, the BIA hired a senior project manager to manage the OCIO E-rate Team and conduct an overall review of program support and outcomes thus far. Two of his primary duties were to "jump start" the BIE consortium application process in order to improve funding outcomes and analyze ways to

improve support and utilization of E-rate subsidies for BIE schools. Since 1998, most of the BIE consortium requests had been denied or largely reduced. Many of the BIE schools had been applying for E-rate subsidies on their own; some were successful, and others were not. The Project Manager explained (Personal communication):

> The BIE were doing applications with their (BIE) own team and the BIA had nothing to do with it until '*Redacted Name*' became CIO. When '*Redacted Name*' became the CIO of Indian Affairs, he consolidated all the technology groups that he could in his organization. BIE staff were brought in at that time. As I recall '*Redacted'* was hired and specifically tasked with developing the E-rate team. She worked in the planning organization. After several years, she was promoted, and I took over Project Management. The E-rate Team and I made a thorough review of the BIE consortium application and individual School application progress…(October 18, 2018)

He recalled, the OCIO E-rate Team provided extensive support to BIE-funded schools with individual E-rate applications and processes. Additionally, the plan steered the consortium process towards Internet circuit subsidies for BIE-operated schools, and guided the tribally-operated schools that elected to opt-in. Tribal schools required acknowledgment to join the consortium; a signed Letter of Agency and proof of an existing technology plan that was approved by a valid technology plan approver. BIE-operated schools fell under the purview of the BIE and therefore, were covered under the umbrella of the BIE Master Technology Plan.

The OCIO E-rate Team concluded, applying for Internet circuits via the consortium process was a more manageable and obtainable process if required processes and document management was adhered to. Previous BIE consortium applications, in addition to Internet Access requests, had attempted to include Internal Connections and Basic Maintenance requests for BIE-funded schools. This created "an entirely unmanageable dilemma – attempting to account for each school's existing inventory, documents, and planning process was too burdensome" (Personal communication, October 18, 2018). In other words, these applications

were usually denied because the consortium leader could not verify the eligibility of equipment in each school.

In addition, the initial BIE E-rate Team was limited to one or two people, and the newer OCIO E-rate Team had only four. They concluded their capacity to support schools included the Internet Access consortium and assistance to schools applying for E-rate subsidies as individual entities.

Solving BIE consortium application funding. According to interview and documents, the OCIO E-rate Team's review of earlier consortium application denials revealed a lack of documentation that validated of the bid selection process. Prior to 1998 and beyond, the BIE had secured a Telecommunication contract through General Services Administration (GSA). This contract was called FTS 2000, and eventually transitioned to FTS 2001. Much of the BIE Internet and Telephone infrastructure relied on these contracts. These contracts were "Federally mandated FTS 2000 contract, placing orders through a Designated Agency Representative (DAR), as directed by the General Services Administration (GSA) contracting officer" (Personal communication, October 18, 2018).

However, during PIA review, the USAC requested documentation that could show evidence of a valid bid assessment process. This documentation might have been available through the original contracting officer, but it was never provided to USAC from the BIE consortium leader. Therefore, the BIE experienced further investigations and denials over the next seven or more years. For instance, the disbursement of funds of $1.3 million from the 2001 Internet circuit consortium application was recalled by USAC. The resulting appeal from the BIE is still ongoing. Additionally, most of the BIE consortium applications that requested

Internal Connections and Basic Maintenance subsidies had been denied for reasons already mentioned above. Ultimately, these applications were denied in consultation with the applicant.

As mentioned, one of his primary duties was to "jump start" the BIE consortium application process in order to improve funding outcomes for BIE-funded school Internet circuits. During the process of reorganization of the consortium processes, he recalled (Personal communication):

> In 2009 we submitted the first Networx based 470 and 471. We could only request funding for schools billed under the Networx contract. That was the total amount that we could claim based on what was billed for that period… we submitted a form 500 with the purpose of allowing USAC to release the unused committed funds. It took the better part of 3 years to get Verizon to move all circuits from FTS 2001 to Networx. (October 19, 2018)

In summary, the 2009 BIE consortium application process was linked to a new RFP that moved away from the previous Internet circuit contract called FTS 2001. The new contract awarded under the 2009 FY was called "Networx." The company awarded management under the Networx contract was Verizon Global. The contract extended for a period of five years.

The dilemma caused by the new contract was Verizon's coordination with each Local Exchange Carrier (LEC) amongst 23 states that provided Internet circuits for up to 160 or more BIE-funded schools. A portion of this coordination required Verizon and the LECs to move existing FTS 2001 circuits over to the new Networx contract. This resulted in a phased in approach to commitment by USAC and the SLD. As circuits assigned to schools were moved over to Networx, they were allowed funding. In some cases (seen later), this caused disbursed funding amounts to exceed commitment requests.

Further interviews revealed that another effort is Verizon's coordination with LECs to increase bandwidth capacity for individual circuits. Near the 2010 time-frame, some schools decided to disconnect from the BIA T-1 service because of the limited bandwidth. Coordination

shortcomings between Verizon and LECs was indicative of this dilemma. Some schools elected to request third-party Internet access through E-rate to upgrade their bandwidth to fit the requirements of current and future Web-based Internet needs.

Support on the pine ridge reservation and BIA technology. Interview information and records indicate, that on the Pine Ridge Reservation, schools were introduced and possibly accepted E-rate support from the Pine Ridge ELO and the OCIO E-rate Team between 2008 and 2009. If they accepted support, the ELO support employee oversaw the E-rate process onsite and the OCIO E-rate Team hired a consultant to work with BIE-funded schools. This support assisted schools approved technology plans and momentum towards application for E-rate subsidies. In general, the schools receiving E-rate support, were drafting their first technology plan, and in some cases, were applying for E-rate subsidies for the first time.

Interviews surmise, in addition to technology planning for E-rate, schools may have become aware of a BIA technology initiative referred to as the Common Operating Environment or COE. COE as defined states (personal communication, January 1, 2017):

> This Educational Native American Network - Use Agreement (ENAN-UA) shall be incorporated as part of the Memorandum of Understanding, contract, cooperative agreement or grant negotiated between the Bureau of Indian Education and the XX Tribe/School District to provide approved access for authorized users at the XX School to the Bureau of Indian Affairs' Educational Native American Network (ENAN), a secure, Federal Information Technology (IT) system. (p. 1)

COE required that schools adhered to certain equipment standards in order to be connected to and receive support from the BIA OCIO support elements in the field. Equipment standards included:

1. Switch technology will be CISCO.
2. Network Servers will be Windows Network Operating Systems.
3. Wireless Access Points and Controllers will be CISCO.

4. Phone Systems will be CISCO Voice over IP (VoIP).

COE included four primary benefits:

1. Schools are provided Internet circuits through the BIE consortium application process and will be upgraded as technology develops.
2. Schools will receive content filtering using CIPA complaint standards.
3. Schools will receive security products such as Enterprise Anti-Virus and Anti-Malware solutions and Servers if E-rate does not pay for them.
4. Schools will receive Network level (switch, phone, and server) support from the BIA ENAN support, including free access to software such as Windows Operating Systems, Microsoft Office.

COE was already mandatory for BIE-operated Schools; as federal entities, they are operated by the BIE and the BIA enforces the technology standards. However, tribally-operated schools have individual sovereignty and could choose enrollment or support their own school network. The BIA in coordination with the BIE began offering COE to Tribal/Grant schools as part of their reorganization efforts to improve support for E-rate and other technology initiatives.

COE includes many cost saving benefits mentioned above, and some shortcomings. One shortcoming is CISCO telephone infrastructure. Oddly, the BIA promised that all equipment under COE would be supported by field technicians. After the first few years of COE implementation, the BIA realized the amount of help desk ticket support required by CISCO phone systems was beyond their personnel capacity and capability. As a result, they eliminated support CISCO phone support.

This concludes the history of improved BIA E-rate support to BIE-funded schools – 2005 through 2009. The following data will review FY 2008 or E-rate Year 11.

FY 2008 (July 1, 2008 through June 30, 2009) – E-rate year 11. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2008. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2008. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c).

Planning. Records indicate School "A" wrote their first technology plan during the fall of 2007 and had it approved by the BIE in December 2007. This technology plan covered a three-year period from 2007 through 2010. The plan indicated the school had a limited Network Infrastructure at the time the plan was written. Only 20 computers were onsite for teacher use and a partial T-1 Internet circuit of 750Kbs and CISCO router was provided by the BIA with CIPA firewall support. The school only had one working server that had Internet connectivity but was not being used for domain control. The computers were not assigned to a domain network but had Internet connectivity via DHCP (Dynamic Host Control Protocol) provided by the BIA router.

This meant using local computer accounts plugged into ethernet cable for Internet access. There were no functional Anti-Virus protocols in place. There was no fiber connectivity between adjacent buildings, but Ethernet cable was used to connect some buildings from roof to roof. There was limited switching support and no wireless connectivity existed. The school also had an aging telephone system dated to 2002. As a result, the technology plan directed the school to use E-rate subsidies to upgrade their entire network. Additionally, the plan directed

School “A” to enroll in BIA COE, communicating it would be a great way to save money, receive support, and improve technology efficiency.

Applying. The DRT and onsite records revealed that School “A” applied for E-rate services including Telecommunications, Internet Access, Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by the consultant hired by the BIA. According to a source who worked at the school, the BIA consultant “applied for way too many things, and he applied for specific items by make and model” (Personal Communication, July 10, 2018). Reviewing the FCC Form 470 validated her claim.

The FCC Form 470 did not add the words “or equivalent” to the make and model of several of the individual items. This oversight was not exposed by USAC’s program review procedures, but it could have resulted in denial of the entire application (USAC, 2018d). This FCC Form 470 (or portions of) will not be displayed in figure in order to protect the school’s identity.

For Priority II Services (Category Two) – Internal Connections, the FCC Form 470 requested E-rate subsidies for just CISCO network switches, just CISCO Wireless components, just Dell servers, and just Avaya for a new phone system. The consultant also requested a video distribution system to include coax cabling to each classroom. This system was to facilitate onsite storage and delivery of educational video content. The remainder of the Internal Connections requests were generic in nature and were not questioned during this research. They included fiber and trenching to connect all buildings in the network, Ethernet cable and drops for offices and classrooms, battery backups, project management and installations costs (USAC, 2018d).

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for existing server and phone system maintenance, and maintenance of school cabling (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services, existing cell phone service, and several new cell phones (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for a new T-1 connection, email, and web hosting services (USAC, 2018d).

According to the OCIO E-rate Project Manager interviewed, this was the first year the BIA had used a consultant for E-rate support. His indicated the consultant was very knowledgeable with the E-rate program, but the work load given to the consultant was extreme. As result, the consultant developed templates for technology plans and FCC Form 470 applications and at times, E-rate subsidy requests may have asked for more technology services then schools could accommodate or even the wrong technology.

Because of the case load given to the consultant, applications were often filed through USAC before the school had time to analyze them. According to interview, this was the case in the School "A" application for FY 2008. Essentially, with all the E-rate and other ancillary BIA technology initiatives happening simultaneously, information wasn't fully disseminated to all parties concerned.

Nevertheless, onsite documents and interview sources revealed that School "A" did receive several quotes from service providers linked to FY 2008 FCC Form 470. In the course of the bid assessment window or later, the school was able to assess and select a service provider

and remove service requests they felt were either unnecessary or didn't support their future needs.

Utilizing. The DRT (Figure 23) shows the funding and utilization figures for FY 2008. As mentioned, School "A" removed service requests they felt were either unnecessary or didn't support their future needs. Initially (according to records), because of COE requirements, the school did not include a new Avaya Phone System on their FCC Form 471. Instead they decided to wait until the following year to apply for a CISCO or equivalent phone to meet the requirements of COE enrollment. In addition, the school did not include a new T-1 line on the FCC Form 471 because they were using the BIA provided T-1 and needed to stay on that system to for COE enrollment. Without the new phone system and T-1 circuit, the school submitted FCC Form 471 and requested subsidies for all other services on the FCC Form 470.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2008	8/5/2008	FUNDED		$10,969.24	INTERNAL CONNECTIONS MNT	$10,969.24	$10,969.20
2008	8/5/2008	FUNDED		$318,659.40	INTERNAL CONNECTIONS	$318,659.40	$187,974.90
2008	8/5/2008	NOT FUNDED		$144.07	INTERNET ACCESS	$0.00	
2008	8/5/2008	NOT FUNDED	MR1: The FRN was modified from 83.33 to _70 to agree with the matrix eligibility for sharp school web hosting service.	$900.07	INTERNET ACCESS	$0.00	
2008	8/5/2008	FUNDED	MR1: The FRN was modified from 788.20 to 106.74 to agree with the applicant documentation, applicant did not include ineligibles and wished not to include the additional lines they were	$8,512.56	TELCOMM SERVICES	$1,152.79	$1,152.79
2008	8/5/2008	FUNDED		$9,173.30	TELCOMM SERVICES	$9,173.30	$8,225.20

Figure 23. Portion of School "A" FY 2008 DRT. Represents a portion of the DRT information for School "A" FY 2008. It demonstrates six funding requests and amounts committed and disbursed for FCDL approval. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

FCDL comments or records indicate School "A" received a PIA review during the application cycle. The questions were minimal, and all responses were delivered to the SLD. School "A" received its FCDL on August 5, 2008 authorizing initial funding for all six FRNs.

In November 2008, prior to filing FCC Form 486, the school submitted an FCC Form 500 requesting the SLD to cancel both Internet Access subsidies (email and web hosting). Though, the BIA had a plan for future email services, the school elected to use a local consultant for their web site presence. The FCC Form 500 can be used to change the start date or contract date for a given FRN or reduce the funding amount of or cancel an FRN (USAC, 2019b). This is indicated as "Not Funded" for both Internet Access FRNs in Figure 23.

According to interview, the school instructed the selected service provider to remove all equipment associated with video distribution. With the advice of the ELO and the OCIO E-rate Team, the school decided there are much cheaper, and even free video conferencing technologies available. Additionally, the school only had part time technology support and they did not feel she would have time to maintain all of the new technology.

Note in Figure 23, the FRN for Internal Connections is funded for $318,659.40 dollars but the amount disbursed was reduced to $187,974.90 dollars. When the service provider invoiced the SLD, they had to remove the cost of omitted video equipment and cabling, thus, reducing the overall disbursed amount.

According to DRT data, School "A" also received most of their funding back in disbursements for Basic Maintenance and Telecommunications discount subsidies.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team, provided evidence of detailed accountability systems. The school had paper and electronic files stored onsite. The BIA also had electronic files stored on a file server and were provided to the research as needed.

School "A" summary – FY 2008. School "A" wrote another plan during FY 2008 and 2009 that assisted them with enhancing technology. This plan was an Enhancing Education Through Technology (EETT) Grant application. As evidence, it makes a sound argument for their experience with E-rate and technology growth during this time frame. Three excerpts follow (Personal Communication):

> With a lot of planning, diligence and patience, we went from what is shown in Figure 1 (Old Server Room and Network) to what can be viewed in Figure 2 (New Server Room and Network). The old network server room was loaded with older equipment that had been in place for years using network software that was so old, Microsoft did not even support it anymore. All the separate buildings were connected using Ethernet cabling between buildings and the entire middle school was connected using a low grade (for home use) wireless router. This little router was the connecting bandwidth for every computer in the middle school. It was truly a sad state of affairs. (July 10, 2018)

> E-rate funding for School year 2008-2009, we were able to upgrade the entire campus network using existing OCIO standards of equipment as its template for success. We currently enjoy a network connected to the ENAN II infrastructure with a partial T-1 connection. Our T-1 connection interacts with an IA-OCIO provided CISCO 3700 series router connected to CISCO Catalyst 3560 POE switches throughout the campus. All campus buildings are also connected with fiber and CISCO switching throughout… We have an integrated wireless network…We have two brand new Dell PowerEdge 2950III servers running the network. We also replaced all older CAT 5 Ethernet Twisted Pair cabling with approximately 190 CAT 6 throughout the campus… (July 10, 2018)

> We updated all electrical capacities necessary to facilitate this new network and also uses APC Rack-Mount 1500va UPS devices for the sever room and middle school and APC 650va UPS devices for the separate building switches that use just one CISCO 24 port switch. (July 10, 2018)

During E-rate Funding year 2008, School "A" was able to install a new network facilitating the connectivity of at least eight direct connected computers per classroom and was more capable to manage all computers and devices requested through this EETT Grant. They received needed discounts for telephone services, and they were able to meet the requirements of enrollment into the BIA Common Operating Environment.

This concludes the School "A" application data for FY 2008 or E-rate Year 11. The following data will review School "B" FY 2008 application data.

School "B" E-rate application – FY 2008. The DRT revealed School "B" applied for E-rate subsidies using two FCC Form 470 linked to one FCC Form 471 (USAC, 2018c).

Planning. Records indicate School "B" planned and applied for FY 2008 on their own with minimal support from the Pine Ridge ELO and the OCIO E-rate Team. Records indicate School "B" wrote their first technology plan during the fall of 2007 and had it approved by the BIE in December 2007. This technology plan covered a three-year period from 2007 through 2010.

The plan indicated a limited Cat5 ethernet backbone existed with no fiber connectivity between buildings. Cat5 cable was used from roof to roof to connect buildings on the LAN. They had 10 wireless Apple wireless Antennae connected to the Cat5 cabling to provide wireless access to the campus. The wireless network had three access points that were not working. The school had a computer lab with Apple systems that were degraded due to the limited wireless capacity. The plan directed an upgrade to Cat6 ethernet system cable of increased bandwidth. The school also wanted to conduct wireless audit to assure complete coverage for all learning areas. One excerpt stated "there are significant dead spots on the current network and in the case of the Gifted and Talented program, the wiring box needs to be replaced" (Personal Communication, August 13, 2018).

School "B" expressed a need to monitor network bandwidth and was going to ask the BIA how to do this. Bandwidth monitoring would allow them to review utilization. They currently had a partial T-1 provided by the BIA allowing 750kbs of bandwidth. School "B" stated in their plan that "a network monitor of bandwidth should be installed to provide evidence

of needed expansion of bandwidth as the use grows" (Personal Communication, August 13, 2018).

An excerpt claimed (Personal Communication):

> The biggest challenge for the infrastructure at our school is the maintenance of the network and the classroom level machines. The school does not employ a network technician. As a result, simple server maintenance, use upgrades and edits, and classroom level troubleshooting are not getting done. As a result, faculty does not find the computers they do have as useful. It is this author's recommendation that a network technician be hired, even at part-time to maintain the network. Since the network is Macintosh based it is the recommendation of this author that the school considers working with a Shannon County School to share a network technician who is Apple certified to maintain the network and conduct periodic maintenance of classroom computers. (August 13, 2018)

This suggests the school was not aware of the COE enrollment initiative. COE enrollment would have allowed the school more support from the BIA, thus easing their burden of network maintenance.

The technology plan also revealed that their existing telephone system experienced significant problems over the past year. This phone system was provided by an earlier E-rate consortium through ONEC. An excerpt explaining the dilemma follows (Personal Communication):

> …this telephone system is a private phone system and requires maintenance by trained phone technicians. The school does not have a trained technician on staff and hiring and training a person is cost prohibited. The original goal of the ONEC system was to provide phone, internet and radio conferencing services across the phone system. These goals were not met, with only phone service being connected. It is the current recommendation that the school consider migrating to a phone system that can be out sourced to a local phone company in the next 12 months. The lack of personnel to manage this level of technology is creating stress between the community and the school. (August 13, 2018)

Applying. The DRT and onsite records revealed that School "B" applied for E-rate services including Telecommunications, and Internal Connections. The FCC Form 470 was prepared by a former business manager in the school. This person as unavailable for interview.

For Priority II Services (Category Two) – Internal Connections, the FCC Form 470 (Figure 24) requested E-rate subsidies for a new server and software, fiber cabling, wireless access points, hubs, new firewall and tape backup, and a new phone system with voicemail (USAC, 2018d). One can see a level of ambiguity exists. A service provider would be required to ask questions to clarify every entry.

Internal Connections

Service or Function:	Quantity and/or Capacity:
server	1 Server
software	Server Operating System
data distribution	6 access points, 6 hubs
data protection	Firewall, tape backup
cabling	245 linear feet fiber cabling, server cables
Telephone components	pbx, voicemail,

Figure 24. Portion of School "B" FY 2008 FCC Form 470. Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 (Figure 25) requested E-rate subsidies for existing local and long-distance services, existing cell phone service, and several new cell phones (USAC, 2018d).

Telecommunications

Service or Function:	Quantity and/or Capacity:
POTS	12
Cellular Services	6
Local And Long Distance	12

Figure 25. Portion of School "B" FY 2008 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

Utilizing. The DRT (Figure 26) shows the funding and utilization figures for Funding Year 2008. School "B" received its FCDL on July 16, 2008 authorizing initial funding for all four FRNs. According to DRT data, two of the FRNs for School "B" were modified. The first request for Telecommunications was modified from $36,255.60 dollars to $18,686.70 dollars.

The justification was to agree with applicant documentation. The FRN for the Avaya Telephone system (Internal Connections) was reduced from $17,620.14 dollars to $12,348.40 dollars to adjust for ineligible products.

The FCDL comments indicate School "B" received a PIA review during the application cycle. The responses from the school to the SLD would have included documentation via Phone bills or Avaya Phone system contract specifics. The responses resulted in the modifications to the original funding requests.

The last FRN was funded but no disbursements were made. Without records or interview, the reasons School "B" elected not to install the remaining equipment (firewall, hubs, server, etc.) is unknown.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2008	7/16/2008	FUNDED	MR1: The FRN was modified from _3357 to 1730.25 to agree with the applicant documentation.	$36,255.60	TELCOMM SERVICES	$18,686.70	$17,571.00
2008	7/16/2008	FUNDED		$5,767.20	TELCOMM SERVICES	$5,767.20	$4,212.00
2008	7/16/2008	FUNDED	MR1: The FRN was modified from _19577.93 to 13720.44 to remove ineligible items of Avaya Phone 5420 and 5410 Digital Phones of the PBX Internal Connections request. <><><><> MR2: The dollars requested were reduced to remove: {the ineligible product Avaya Phones.	$17,620.14	INTERNAL CONNECTION	$12,348.40	$12,348.40
2008	7/16/2008	FUNDED	MR1: In consultation with the applicant, the service provider has been changed to 143032232 SPIN number. <><><><> MR2:The dollars requested were reduced to remove: {the ineligible product(s)/service(s) spare hard drive. <><><><> MR3: The FRN was modified from 21,936.37 to 21819.43 to agree with the applicant documentation.	$19,742.73	INTERNAL CONNECTION	$19,637.49	$0.00

Figure 26. Portion of School "B" FY 2008 DRT. Represents a portion of the DRT information for School "B" FY 2008. It demonstrates four funding requests and amounts committed and disbursed for FCDL approval. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Accountability. School "B" did not have any documentation onsite for FY 2008. All documentation was retrieved from USAC databases and BIA sources and files.

School "B" summary – FY 2008. Evidence suggests that School "B" did not receive support from the Pine Ridge ELO or the OCIO E-rate Team during FY 2008. However, during the latter portion of FY 2008, School "B" began liaison and support with these two agencies. At that time, they began preparation of a second Technology Plan an became aware of the COE initiative. This plan indicated their interest in the COE initiative and in the 2009-2010 EETT Grant. This information will be covered in the next section.

Like the School "A" situation, with all the E-rate and other ancillary BIA technology initiatives happening simultaneously, information wasn't fully disseminated to all parties concerned. School "B" might have applied differently, had they known fully about the BIA COE initiative. School "B" was able to apply for and utilize E-rate subsidies during FY 2008, received needed discounts for telephone services and was able to install a new Avaya phone system.

This concludes the School "B" application data for FY 2008 or E-rate Year 11. The following data will review the BIE consortium data for FY 2008.

BIE consortium application – FY 2008. The DRT revealed School the BIE filed one new FCC Form 470 consortium application linked to one FCC Form 471 (Figure 27). This application requested discounts for T-1 Internet service discounts for only 128 BIE-funded schools. However, once the FCC Form 471 was submitted, only BIE-operated Schools were included (USAC, 2018d, 2018e). The reason for the absence of Tribal/Grant Schools is unknown. The FCC Forms 471 included only one funding request, and it was denied because the bid selection process could not be documented.

The amount requested for School "A" and School "B" could not be extrapolated from the data, but it included service requests totaling $605,529.76 dollars (USAC, 2018c). The

assumption is the financial subsidies lost to School "A" and School "B" were worth over $4,730 dollars each. This number is derived by dividing the total amount by 128 schools.

Commitment	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount
NOT FUNDED	MR1: The shared discount was reduced to a level that could be validated by third party data. <><><><><> MR2: The dollars requested were reduced to remove: support to residential facilities $ 515.82/month. <><><><><> MR3: The FRN was modified from $56,067.57/month to $55,551.75/month to agree with the applicant documentation. <><><><><> DR1: FCC Rules require applicants to retain all documentation regarding the competitive bidding process. You were asked how you selected the service provider for this FRN off of the GSA schedule. You have indicated that you do not have the information to demonstrate how you selected between the multiple vendors available on the GSA contract. Therefore, the FRN is denied.	$605,529.76	INTERNET ACCESS	$0.00

Figure 27. Portion of BIE FY 2008 DRT. Represents a portion of the DRT information for the BIE. It demonstrates one funding request and reasons for FCDL denial for FY 2008. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

This concludes the BIE consortium data for FY 2008. The following data will review the application and consortium information for FY 2009.

FY 2009 (July 1, 2009 through June 30, 2010) – E-rate year 12. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2009. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2009. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to two FCC Forms 471 (USAC, 2018c).

Planning. Records indicate School "A" accepted E-rate support from the Pine Ridge ELO and the OCIO E-rate Team. School "A" followed their planning in FY 2008 and upgraded their school network minus their telephone system. FY 2009 provided them the opportunity to finalize plans to request E-rate subsidies for a phone system that followed COE requirements. The plan also directed efforts to continue applying for telephone discounts. They also planned

on applying for Basic Maintenance for new infrastructure installed the previous year and for their existing Avaya Telephone system, in the event they were not funded for a new VoIP system.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate services including Telecommunications, Internet Access, Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by the school with assistance from the Pine Ridge ELO and the OCIO E-rate Team.

For Priority II Services (Category Two) – Internal Connections (Figure 28), the FCC Form 470 requested E-rate subsidies for a new Voice over IP phone system. (USAC, 2018d).

Internal Connections

Service or Function:	Quantity and/or Capacity:
Replace Current Phone System with VoIP Solution. Retain analog capability for Fax machines. School currently has 20 incoming lines	Supporting elem and middle school with over 250 students

Figure 28. Portion of School "A" FY 2009 FCC Form 470. Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections the FCC Form 470 requested E-rate subsidies for or new infrastructure installed the previous year and for their existing Avaya Telephone system (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications (Figure 29), the FCC Form 470 requested E-rate subsidies for existing local and long-distance services, existing cell phone service, and a dedicated connection line for the new VoIP phone system. (USAC, 2018d). A dedicated line such as this allows the VoIP phone to be connected to one line versus using the existing analog phone lines within the school.

Telecommunications

Service or Function:	Quantity and/or Capacity:
High Speed Voice Connection for Voice Services (Minimum 1.5 to 3 Meg Bandwidth Capability) Quote needed; Include Installation, Travel and Per Diem Fees	Supporting new VoIP System for elemandmiddle school supporting over students and staff
Existing Local Telephone Service	supporting elem and middle school with over 250 students
Existing Long Distance Telephone Service	supporting elem and middle school with over 250 students
Exisiting Cell Phone Service	supporting elem and middle school with over 250 students

Figure 29. Portion of School "A" FY 2009 FCC Form 470. Represents the FCC Form 470 categories of service request section for telecommunications. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

For Priority I Services (Category One) – Internet Access (Figure 30), the FCC Form 470 requested E-rate subsidies for a dedicated connection line for the new VoIP phone system. (USAC, 2018d). A dedicated line such as this allows the VoIP phone to be connected to one line versus using the existing analog phone lines within the school.

Internet Access

Service or Function:	Quantity and/or Capacity:
Additional High Speed Internet Line Connection for Data Services (Minimum 1.5 to 3 Meg Bandwidth Capability) Quote needed; Include Installation, Travel and Per Diem Fees	Supporting elem and middle school with over 250 students

Figure 30. Portion of School "A" FY 2009 FCC Form 470. Represents the FCC Form 470 categories of service request section for Internet access. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

Utilizing. The DRT (Figure 31) shows the funding and utilization figures for FY 2008. Records indicate School "A" received a PIA review during the application cycle. The questions were minimal, and all responses were delivered to the SLD. School "A" received its FCDL on November 3, 2009 authorizing initial funding for all six FRNs. Disbursements for the two FRNs referencing the dedicated line for the VoIP phone system were null.

Documents and interview confirmed the school submitted FCC Form 500 and canceled these two FRNs. An FCC Form 500 was not located onsite at the school. However, the technology plan indicates the school elected to keep the new VoIP phone system connected to the analog lines. This way the school did not have to re-wire analog lines for FAX machines. Additionally, since the school is relatively small, the bandwidth available with the existing analog lines was satisfactory to handle the data load of the new VoIP phone system.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of adequate accountability systems. The school had paper and electronic files stored onsite of most documents except the FCC Form 500. The BIA also had electronic files stored on a file server and were provided to the research as needed.

School "A" summary – FY 2009. School "A" was able to apply for and utilize E-rate subsidies for a new CISCO VoIP phone system that support BIA COE enrollment. They received needed discounts for telephone services and Basic Maintenance of Internal Connections. The Basic Maintenance requested for the existing Avaya Phone system was not required because they received funding for a new VoIP phone system.

Note: Eventually, the intricacies involved with the CISCO phone system impacted the school. Approximately a year and half after installation, the BIA eliminated CISCO phone support as a COE service. Operational needs and rotation of employees require constant changes to the phone system. For instance, each year, phone directories must be established, ensuring the phone system, voice mail, and greetings are programmed in the switch and directories are displayed on the phone. Without BIA certified CISCO support, the situation was troublesome, and they had to outsource technical expertise several times a year to keep the phone system and directories managed.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2009	11/3/2009	FUNDED	MR1: In consultation with Alltel, the service provider has been changed to Alltel Trust Company SPIN number 143033503. <><><><> MR2: The dollars requested were reduced to remove: Regulatory and Admin Fee for $5.10 and Ringback Tones for $0.99. <><><><> MR3: The FRN was modified from $336.15 to $330.06 to agree with the applicant documentation.	$3,630.42	TELCOMM SERVICES	$3,564.65	$3,564.65
2009	11/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/10/2009 to agree with the applicant documentation.	$15,782.36	INTERNAL CONNECTIONS MNT	$15,782.36	$15,782.36
2009	11/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/10/2009 to agree with the applicant documentation.	$6,930.00	INTERNET ACCESS	$6,930.00	
2009	11/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/10/2009 to agree with the applicant documentation.	$13,529.70	INTERNAL CONNECTIONS	$13,529.70	$13,529.70
2009	11/3/2009	FUNDED	MR1: The dollars requested were reduced to remove: Late Payment Fee for $15.16, Verified Account Code for $28, Directory Non Published Number for $12, DSL Move or Reconnect Charge for $42, and One Time Prorated Charges for $72.53. <><><><> MR2: The FRN was modified from $987.15 to $817.46 to agree with the applicant documentation.	$10,661.22	TELCOMM SERVICES	$8,828.57	$8,490.39
2009	11/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/10/2009 to agree with the applicant documentation.	$12,287.95	TELCOMM SERVICES	$12,287.95	

Figure 31. Portion of School "A" FY 2009 DRT. Represents a portion of the DRT information for School "A" FY 2009. It demonstrates six funding requests and amounts committed and disbursed for FCDL approval. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

This concludes the School "A" application data for FY 2009 or E-rate Year 12. The following data will review School "B" FY 2009 application data.

School "B" E-rate application – FY 2009. The DRT revealed School "B" applied for E-rate subsidies using two FCC Forms 470, each linked to one FCC Forms 471 (USAC, 2018c). Records indicate School "B" received support from the Pine Ridge ELO and the OCIO E-rate Team.

Planning. Records indicate School "B" wrote their second technology plan during FY 2008 and had it approved by the BIE in June 2009. This technology plan covered a three-year period from 2009 through 2012. This technology plan listed the original network deficiencies noted in the School "B" FY 2008 overview. In addition, the school's connection with the OCIO E-rate Team and the Pine Ridge ELO ignited their interest in applying for E-rate subsidies that would allow for BIA COE enrollment.

Applying. The DRT and onsite records revealed that School "B" applied for E-rate services including Telecommunications, Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by a former business manager in the school with the assistance of the OCIO E-rate Team. The former business manager was unavailable for interview.

For Priority II Services (Category Two) – Internal Connections, the FCC Form 470 requested E-rate subsidies for a network upgrade including server, cabling, battery backups, switches, fiber, security appliance, and project management and installation (USAC, 2018d). The FCC Form 470 will not be depicted, as it seems unnecessary to show each one throughout this study. However, the school did request COE specific items such as "CISCO POE or equivalent switches" (USAC, 2018d).

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, and switch maintenance.

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 32) shows the funding and utilization figures for FY 2009. Records indicate School "B" received a PIA review during the application cycle. The questions were minimal, and all responses were delivered to the SLD. School "B" received its FCDL for Priority I (Category One) service on June 9, 2009 and Priority II (Category Two) service on September 3, 2009 authorizing initial funding for all four FRNs.

The DRT indicates the Internal Connections FRN disbursed amount is less than the amount funded. This is because the BIE Internet circuit eliminated the need for a school to have a separate security appliance onsite. Interview confirmed the OCIO E-rate Team recommended this elimination.

Accountability. Review of documents onsite at School "B" and through communication with the OCIO E-rate Team provided evidence of less than adequate accountability systems. The school had some paper and electronic files stored onsite. The BIA also had some electronic files stored on a file server and were provided to the research as needed.

School "B" summary – FY 2009. School "B" was able to apply for and utilize E-rate subsidies during FY 2009. They were able to install a new network facilitating the connectivity of their classroom and staff computers. Except for their phone system, they were able to meet the other network requirements of enrollment into the BIA Common Operating Environment. They received needed discounts for telephone services and Basic Maintenance of Internal Connections. However, onsite visits and interviews have provided no evidence that School "B" ever applied for the EETT grant or integrated into the BIA Common Operating Environment.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2009	9/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/11/2009 to agree with the applicant documentation.	$11,676.64	INTERNAL CONNECTIONS MNT	$11,676.64	$11,676.64
2009	6/9/2009	FUNDED	MR1: The dollars requested were reduced to remove: Verified Acct Code and Internet since Form 470 did not post for Internet Access. <><><><> MR2: The FRN was modified from $1,466.02 to $1,442.07 to agree with the applicant documentation.	$15,833.02	TELCOMM SERVICES	$15,574.36	$15,574.36
2009	6/9/2009	FUNDED	MR1: The dollars requested were reduced to remove: ProductGuard, Regulatory and Admin Fee, 44577 Yurcrush Alerts, 75714_Trivia Alert, 71422 Mmp3g.com, PlatGuard Plus, Ringback Tones, and 30477 Funmobile Chat. <><><><> MR2: The FRN was modified from $401.12 to $333.98 to agree with the applicant documentation.	$4,332.10	TELCOMM SERVICES	$3,606.98	$3,606.98
2009	9/3/2009	FUNDED	MR1: The Contract Award Date was changed from 07/01/2009 to 02/11/2009 to agree with the applicant documentation.	$207,018.94	INTERNAL CONNECTIONS	$207,018.94	$183,051.00

Figure 32. Portion of School "B" FY 2009 DRT. Represents a portion of the DRT information for School "B" FY 2009. It demonstrates four funding requests and amounts committed and disbursed for FCDL approval. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

This concludes the School "B" application data for FY 2009 or E-rate Year 12. The following data will review the BIE consortium data for FY 2009.

BIE consortium application – FY 2009. The DRT revealed the BIE applied for E-rate subsidies using three FCC Forms 470, each linked to one FCC Form 471 (Figure 33).

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2009	6/23/2010	FUNDED	MR1: The shared discount was reduced	$6,507,200.56	TELCOMM SERVICES	$82,459.55	$82,459.55

Figure 33. Portion of BIE FY 2009 DRT. Represents a portion of the DRT information for the BIE. It demonstrates one funding request and amounts committed and disbursed for FCDL approval for FY 2009. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The two schools in this study were only included on one FCC Form 470; this application requested discounts for T-1 Internet service discounts for 162 BIE-funded schools. The DRT indicates a large request followed by a minimal commitment and disbursed amount, resulting in the phasing of contacts from FTS 2001 to Networx.

This concludes the BIE consortium data for FY 2009. Review of data for FY 2010 through 2017 revealed challenges related to funding reimbursements. The following information will outline those findings. Following this section, application and consortium data review will continue for FY 2010 and beyond.

Challenge of funding reimbursements – FYs 2010 – 2017. Between FYs 2010 and 2017, both schools in this study might have experienced no disbursements in their cellular phone service FRNs. This is because reimbursements or invoicing procedures were either not understood by the applicant or the service provider and some process was missed. Though each detail is unknown, this phenomenon results from various conditions.

In the early years, the local telephone company always facilitated reimbursements or discounts for schools participating in E-rate subsidies. As an example, the annual cost for Local and Long-distance phone service is $12,000 dollars or $1000 dollars per month for a school. The school applied for discounts and waited for their FCDL approving the FRN. In the meantime, since this service must be paid for whether they get funded or not, the school paid for services from July 1, 2009 through November 1, 2009. The school receives their FCDL approving funding on November 1, 2009; meaning they have paid for four months of service or $4,000 dollars. The FCDL awards a funding commitment at 90% or $10,800 dollars. The school's portion is the difference of 10% of the annual price or $1,200 dollars. They have paid $4,000, resulting in an overpayment of $2800 dollars – which is owed back to them.

The service provider files an FCC Form 474, Service Provider Invoice (SPI) Form, to request reimbursements from USAC for their portion of the FRN award or $10,800 dollars. The service provider receives their monies and credits the $2800 dollars back to the school in the billing cycle it reaches a balance. From that point forward, the school's telephone bill is discounted accordingly throughout the remaining FY.

However, in this case, the cellular phone company serving the schools in this study, would not file a 474 and wanted the school to do the invoicing through the use of an FCC Form 472, the *Billed Entity Applicant Reimbursement* (BEAR) Form (USAC, 2017ak). This would be the case if the applicant has paid the service provider in full for a service request, requiring that they seek reimbursement for their eligible discounted portion awarded by USAC. Meaning, the school paid for the cellular service in full over the FY, and then go online and file the FCC Form 472 and wait for the service provider to go online and verify the data.

In the case of School "A," the school was receiving support from the OCIO E-rate Team, but the school Business Manager would not fill out the necessary data for the administrative assistant to send to back to the team. As a result, this process failed each FY until School "A" resigned from using cellular service during E-rate modernization's phase out of voice services. This scenario was provided by the OCIO E-rate Team and Project Manager.

School "B" lost two years of cellular phone discount disbursements as well, but interviews did not reveal the reasons. This study assumes similar conditions existed and will refer to it as the cellular phone reimbursement scenario.

This concludes information related to the challenges to funding reimbursements, and the study will continue with application and consortium data for FY 2010.

FY 2010 (July 1, 2010 through June 30, 2011) – E-rate year 13. During this window

of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2010. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2010. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c).

Planning. Records indicate School "A" received support from the OCIO E-rate Team. Evidence indicates School "A" revised their technology plan and received a new BIE technology plan approval letter Effective April 26, 2010. This second revision added three more years, from 2010 through 2013. The plan did not direct any E-rate upgrades for Internal Connections but did direct sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate services including Telecommunications, and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared with support from the OCIO E-rate Team.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, VoIP phone, and switch maintenance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 34) shows the funding and utilization figures for Funding Year 2010. Records indicate School "A" received a PIA review during the application cycle. Evidence indicates the PIA was received towards the end of the FY. School "A" received its FCDL for Priority I (Category One) and Priority II (Category Two) service on June 1, 2011, authorizing initial funding for two FRNs and denying funding for one FRN (USAC, 2018c).

FY 2010 began July 1, 2010 and ended June 30, 2011. The school received the PIA on April 11, 2011 – two and a half months prior to the end of the Funding year. The PIA had questions for all three FRNs and was responded to within the 15-day time limit given by the SLD. In consultation with the OCIO E-rate Team, the school asked the SLD to cancel the FRN for Basic Maintenance.

Basic Maintenance is a contracted service subsidy; as a result, the funding must be used during the FY. Because the school did not pay for the services month-to-month (like telephone services), they could not seek reimbursement through the FCC 472 reimbursement process after funding. At most, the school could have received a month of Basic Maintenance, after the FCDL date of June 1, 2011.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2010	6/1/2011	NOT FUNDED	FRN canceled in consultation with the applicant.	$1,435.43	INTERNAL CONNECTIONS MNT	$11,923.20		51
2010	6/1/2011	FUNDED	MR1: The FRN was modified from $530.98/mo to $246.93/mo to agree with the applicant documentation. <><><><> MR2: The amount of the funding request was changed from $246.93/mo to $219.93/mo to remove the ineligible product(s)/service(s): Verified Account Codes ($12), Non Published Number Charges ($3), and Service Order Charge ($12).	$37,512.90	TELCOMM SERVICES	$5,734.58	$2,375.24	51
2010	6/1/2011	FUNDED	MR1: The FRN was modified from $331.91/mo to $781.25/mo to agree with the applicant documentation. <><><><> MR2: The amount of the funding request was changed from $781.25/mo to $141.65/mo to remove the ineligible product(s)/service(s): Internet Line 605-440-1459 ($133.54), Internet Line 605-440-1480 ($132.31), Internet Line 605-441-1949 ($132.31), Ringback Tones ($1.98), Connect Pack 3 ($6), Premium Alltel Purchases ($10.46) and Equipment ($223)	$103,218.06	TELCOMM SERVICES	$3,606.23		51

Figure 34. Portion of School "A" FY 2010 DRT. Represents a portion of the DRT information for School "A." It demonstrates three funding requests and amounts committed and disbursed for FCDL approval for FY 2010. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Telephone service must be paid whether the school is provided subsidies for E-rate or not. School "A" was obligated to pay for Telephone services beginning July 1, 2010. After their FCDL was processed, they would have been required to apply for reimbursement. The DRT indicates some reimbursement for the second FRN – Local and Long-Distance telephone service, but none for the cellular service FRN.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of adequate accountability systems. The school had paper and electronic files stored onsite of most documents. However, no one had documentation referencing an attempt to seek full reimbursement for Telephone discounts received that year.

School "A" summary – FY 2010. School "A" was able to apply for and utilize minimal E-rate subsidies during FY 2010. The late PIA review process demonstrates an unorganized funding year with USAC and the SLD. As a result, the school lost funding for Basic Maintenance of Internal Connections. The cellular phone reimbursement scenario existed.

This concludes the School "A" application data for FY 2010 or E-rate Year 13. The following data will review School "B" FY 2010 application data.

School "B" E-rate application – FY 2010. The DRT revealed no data on School "B" for FY 2010 (USAC, 2018c). Review of the FCC Form 470 download tool indicated the school applied for Priority I (Category One) subsidies for telephone discounts (USAC, 2018d). However, evidence of FCC Form 471 linkage could not be found. A source indicated a new technology coordinator was hired and reorganized the technology infrastructure. This could have resulted in a lapse of E-rate application processing responsibilities. No further documentation was available onsite or with the OCIO E-rate Team.

This concludes the School "B" application data for FY 2010 or E-rate Year 13. The following data will review the BIE consortium data for FY 2010.

BIE consortium application – FY 2010. The DRT revealed the BIE applied for E-rate subsidies using three FCC Forms 470, each linked to one FCC Form 471. Figure 35 displays the DRT information applicable to the schools in this study.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement
2010	6/29/2010	FUNDED	MR1: The FRN was modified from $99,753.82 per month and $24,554.88 One-Time Charge to $245,637.00 per month and $15,435.36 One-Time Charge to agree with the applicant documentation. <><><><> MR2: The dollars requested were reduced to remove the ineligible Pre-K students at Lake Valley Navajo ($135.09 per month and $10.77 One-Time Charge) and Pre-K students at Crownpoint ($67.54 per month and $5.39 One-Time Charge). <><><><> MR3: The dollars requested were reduced to remove the ineligible product(s)/service(s) to residences ($1,775.48 per month and $111.54 One-Time Charge). <><><><> MR4: The FRN was modified from $245,637.00 per month and $15,435.36 One-Time Charge to $243,658.89 per month and $15,307.66 One-Time Charge to agree with the applicant documentation. <><><><> MR5: The Contract Award Date was changed from 7/16/2009 to 02/12/2009 to agree with the applicant documentation. <><><><> MR6: The Contract Expiration Date was changed from 6/30/2013 to 9/30/2013 to agree with the applicant documentation.	$1,062,792.63	TELCOMM SERVICES	$2,557,116.48	$2,443,015.99

Figure 35. Portion of BIE FY 2010 DRT. Represents a portion of the DRT information for the BIE. It demonstrates one funding request and amounts committed and disbursed for FCDL approval for FY 2010. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The two schools in this study were only included on one FCC Form 470; this application requested discounts for Internet service discounts for 162 BIE-funded schools. This FCC Form 470 was the same one used in FY 2009 – a continuation of the Networx contract. The DRT indicates a commitment request followed by a larger committed amount, and disbursed amount of over $2.4 million. This is due to the credit carry over of the Networx contract mentioned above.

FY 2010 evidence indicates the BIA OCIO E-rate team was able to receive needed consortium funding for the Internet circuits supporting the BIE-funded schools. This interview

source confirms Internet circuit subsidies gained by the schools in this study were approximately $45,000 dollars each for this FY.

This concludes the BIE consortium data for FY 2010. The following data will review the application and consortium information for FY 2011.

FY 2011 (July 1, 2011 through June 30, 2012) – E-rate year 14. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2011. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2011. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to two FCC Forms 471 (USAC, 2018c).

Planning. Records indicate School "A" received support from the OCIO E-rate Team. Evidence indicates the School "A" technology plan directed sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate services including Telecommunications, and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared with support from the OCIO E-rate Team.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, VoIP phone, and switch maintenance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 36) shows the funding and utilization figures for Funding Year 2011. No records were available onsite or through the OCIO E-rate Team indicating PIA. However, the FCDL comments in indicate PIA activity and response by the school. School "A" received its FCDL for Priority I (Category One) on January 4, 2012 and Priority II (Category Two) service on March 13, 2012, authorizing initial funding for three FRNs (USAC, 2018c). This funding wave also came late in the FY.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2011	1/4/2012	FUNDED	MR1: In consultation with the Alltel, the service provider has been changed to AT&T Mobility, Spin Number 143025240.	$1,529.17	TELCOMM SERVICES	$1,529.17		28
2011	1/4/2012	FUNDED		$9,248.90	TELCOMM SERVICES	$9,248.90	$9,248.90	28
2011	3/13/2012	FUNDED	The amount of the funding request was changed from $7801.00/$650.08 mo. to $ 4458.00/$371.50 mo. to remove: ASA 5510 firewall $468.00 and 25 Support hours $2875.00 = $3343.00.	$7,020.86	INTERNAL CONNECTIONS MNT	$4,012.20		38

Figure 36. Portion of School "A" FY 2011 DRT. Represents a portion of the DRT information for School "A." It demonstrates three funding requests and amounts committed and disbursed for FCDL approval for FY 2011. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates full reimbursement for the second FRN – Local and Long-Distance telephone service, but none for the cellular service or Basic Maintenance FRNs. Additionally, interviews indicate the school did not invoice Basic Maintenance services because of the lateness of the FCDL process.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had

documentation referencing PIA reviews or reimbursement forms for Telephone discounts received that year.

School "A" summary – FY 2011. School "A" was able to apply for and utilize minimal E-rate subsidies during FY 2011. The late FCDL date demonstrates an unorganized funding year with USAC and the SLD. As a result, the school lost funding for Basic Maintenance of Internal Connections. The cellular phone reimbursement scenario existed.

This concludes the School "A" application data for FY 2011 or E-rate Year 14. The following data will review School "B" FY 2011 application data.

School "B" E-rate application – FY 2011. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c). Records indicate School "B" received no support from the OCIO E-rate Team.

Planning. Records indicate School "B" had made no revisions to their existing technology plan made. However, the FCC Form 470 indicates the school requested services to items that were not present in previous FYs (USAC, 2018d). The assumption is that the school installed some Internal Connections and added third party Internet Access over the last year that were not requested through E-rate. This is because they did not file an FCC Form 471 during the previous FY. No additional information was available through interview, onsite or through the OCIO E-rate Team.

Applying. The DRT and onsite records revealed that School "B" applied for E-rate subsidies including Telecommunications, Internet Access and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by a former business manager in the school (USAC, 2018d). This person was unavailable for interview.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 (Figure 37) requested E-rate subsidies for the infrastructure they placed into operation with FY 2009 E-rate funding. In addition, they requested maintenance services for a Sonic Firewall filtering appliance. There are no records available onsite or through the OCIO on when the device was placed into operation.

Basic Maintenance of Internal Connections

Service or Function:	Quantity and/or Capacity:
Basic Maintenance and Support	IAW new FCC rules
Network Support	Network Support - Testing and Configuration Allowed
Server Maintenance	1 x Dell Poweredge Server (DNS/DHCP)
Cable Maintenance - repair and replacement (Cat 6 and Fiber)	Testing and Certification IAW BICSI
Switch Maintenance (Cisco Base if allowed)	4 x WS-C3750G-48PS-S; 5 x WS-C3750G-24PS-S
Firewall Maintenance allowed	1 x Sonic Firewall - 01-SSC-7066

Figure 37. Portion of School "B" FY 2011 FCC Form 470. Represents the FCC Form 470 categories of service request section for basic maintenance of internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

For Priority I Services (Category One) – Internet Access, the FCC Form 470 (Figure 38) requested E-rate subsidies for existing Internet Access with the local telephone company (USAC, 2018d). There were no records or onsite information to determine when the school disconnected from the BIA provided partial T-1 circuit. However, a BIA source revealed that it happened sometime during school year 2010.

Internet Access

Service or Function:	Quantity and/or Capacity:
Exisiting Internet Access with Local Telephone Company	Bandwidth - Supports the School Network Internet Access

Figure 38. Portion of School "B" FY 2011 FCC Form 470. Represents the FCC Form 470 categories of service request section for Internet access. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

Utilizing. The DRT (Figure 39) shows the funding and utilization figures for FY 2011. No records were available onsite or through the OCIO E-rate Team indicating PIA. However, the FCDL comments indicate PIA activity and response by the school. School "B" received its FCDL for Priority I (Category One) and Priority II (Category Two) services on June 6, 2012, authorizing initial funding for three FRNs (USAC, 2018c). This funding wave came late in the funding year.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2011	6/12/2012	FUNDED	MR1: In consultation Alltel, the service provider has been changed to AT&T Mobility, SPIN number 143025240. <><><><> MR2: The FRN was modified from $1,390.22/month to $1,418.20/month to agree with the applicant documentation. <><><><> MR3: The amount of the funding request was changed from $1,418.20/month to $1,137.69 to remove: the ineligible product(s) or service(s)Platinum Guard for $6.00/month, Regulatory and...	$15,014.38	TELCOMM SERVICES	$12,287.05	$12,287.05	48
2011	6/12/2012	FUNDED	MR1: The FRN was modified from $2,643.05/month to $1,581.75/month to agree with the applicant documentation. <><><><> MR2: The amount of the funding request was changed from $1,581.75/month to $1,574.75/month to remove: the ineligible product(s) or service(s) VERIFIED ACCT CODE-5 CODES	$28,544.94	TELCOMM SERVICES	$17,007.30	$17,007.30	48
2011	6/12/2012	FUNDED		$9,900.90	INTERNAL CONNECTIONS MNT	$9,900.90		48

Figure 39. Portion of School "B" FY 2011 DRT. Represents a portion of the DRT information for School "B." It demonstrates three funding requests and amounts committed and disbursed for FCDL approval for FY 2011. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates full reimbursement for the telecommunications FRNs – Local and Long-Distance telephone and cellular services, but none for the Basic Maintenance FRN. This indicates the school did not invoice Basic Maintenance services, likely due to the lateness of the FCDL process. There are no records indicating why the school did not process the request for Internet Access. Additionally, no one was available to comment.

Accountability. Review of documents onsite at School "B" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had some paper and electronic files stored onsite for this FY. No information was available to determine why the school did not process the request for Internet Access subsidies.

Their technology plan showed no evidence of revisions reflecting the installation and need for a Sonic Firewall or T-1 circuit. The assumption is School "B" required more bandwidth, thus needed a CIPA filtering appliance as well.

School "B" summary – FY 2011. School "B" was able to apply for and utilize E-rate subsidies for telecommunications discounts during FY 2011. The late FCDL date demonstrates an unorganized funding year with USAC and the SLD. As a result, the school lost funding for Basic Maintenance of Internal Connections.

This concludes the School "B" application data for FY 2011 or E-rate Year 14. The following data will review the BIE FY 2011 consortium data.

BIE consortium application – FY 2011. The DRT revealed the BIE applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 divided into five separate FRNs. The application requested Internet circuit subsidies totaling $4.1 million. The application process funded five FRNs totaling $3.5 million. Funding disbursements for this FY were nearly $1.7 million (USAC, 2018c).

School "A" was included on this application. This FCC Form 470 was a continuation of an existing Networx contract. An interview source confirms the Internet circuit subsidy gained by School "A" was approximately $45,000 dollars for this FY. School "B" was using a third-party circuit and was not included on BIE consortium.

This concludes the BIE consortium data for FY 2011. The following data will review the application and consortium information for FY 2012.

FY 2012 (July 1, 2012 through June 30, 2013) – E-rate year 15. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using

consortium process. Each entity will be reviewed separately for FY 2012. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2012. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to two FCC Forms 471 (USAC, 2018c).

Planning. Records indicate School "A" received some support from the OCIO E-rate Team. Evidence indicates the School "A" technology plan directed sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate services including Telecommunications, Internet Access (for cell phones) and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by school personnel with support from the OCIO E-rate Team.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, VoIP phone, and switch maintenance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for data plans for existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 40) shows the funding and utilization figures for FY 2012. No records were available onsite or through the OCIO E-rate Team indicating PIA. However, the FCDL comments in DRT data indicated PIA activity and response by the school. School "A"

received its FCDL for Priority I (Category One) on July 10, 2012 and Priority II (Category Two) service on December 18, 2012, authorizing initial funding for Priority I (Category One) FRNs and no funding for the Priority II (Category Two) FRN (USAC, 2018c).

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2012	7/10/2012	FUNDED		$1,066.61	TELCOMM SERVICES	$1,066.61		1
2012	7/10/2012	FUNDED		$4,351.00	TELCOMM SERVICES	$4,351.00	$4,351.00	1
2012	12/18/2012	NOT FUNDED	Applicant has not provided sufficient documentation needed to determine the eligibility of the following item(s): response to CiscoBase year request and SKU for Cisco ASA5510 Appliance.	$11,122.06	INTERNAL CONNECTIONS MNT	$0.00		22
2012	7/10/2012	FUNDED		$3,600.50	INTERNET ACCESS	$3,600.50		1

Figure 40. Portion of School "A" FY 2012 DRT. Represents a portion of the DRT information for School "A." It demonstrates four funding requests, amounts committed, denied and disbursed for FCDL approval for FY 2012. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates full reimbursement for the second FRN – Local and Long-Distance telephone service, but none for the cellular service or cellular data. The Basic Maintenance FRN was not funded due to insufficient documentation provided by the applicant. This indicates problems with the cellular phone and subsidy reimbursement process and that the school did not answer the Basic Maintenance PIA review as required. No further data was available to provide further explanation for the PIA resolution.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had documentation referencing PIA reviews or reimbursement forms for telephone and cellular data discounts received that year.

School "A" summary – FY 2012. School "A" was able to apply for and utilize minimal E-rate subsidies during FY 2012. Improper PIA review procedures might have resulted in the lost funding for Basic Maintenance of Internal Connections. The cellular phone reimbursement scenario existed.

This concludes the School "A" application data for FY 2012 or E-rate Year 15. The following data will review School "B" FY 2012 application data.

School "B" E-rate application – FY 2012. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c). Records indicate School "B" received no support from the OCIO E-rate Team.

Planning. Records indicate School "B" made no revisions to their existing technology plan.

Applying. The DRT and onsite records revealed that School "B" applied for E-rate subsidies including Telecommunications and Internet Access. They did not reapply for Basic Maintenance of Internal Connections as in the previous FY. The FCC Form 470 was prepared by a new business manager in the school (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for existing Internet Access with the local telephone company (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 41) shows the funding and utilization figures for Funding Year 2012. There was no indication of PIA for this FY. School "B" received its FCDL for Priority I (Category One) services on August 13, 2012 authorizing initial funding for two FRNs

(USAC, 2018c). There are no records indicating why the school did not process the request for Internet Access. Additionally, no one was available to comment.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2012	8/13/2012	FUNDED		$16,140.82	TELCOMM SERVICES	$16,140.82	$16,140.82	6
2012	8/13/2012	FUNDED		$6,321.56	TELCOMM SERVICES	$6,321.56	$6,321.56	6

Figure 41. Portion of School "B" FY 2012 DRT. Represents a portion of the DRT information for School "B." It demonstrates two funding requests and amounts committed and disbursed for FCDL approval for FY 2012. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates full reimbursement for the telecommunications FRNs – Local and Long-Distance telephone and cellular services.

Accountability. Review of documents onsite at School "B" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had some paper and electronic files stored onsite for this FY, but no comments were given for why the school did not process the request for Internet Access subsidies for their third-party circuit. Additionally, their technology plan showed no evidence of revisions reflecting the installation and need for a Sonic Firewall or third-party Internet circuit.

School "B" summary – FY 2012. School "B" was able to apply for and utilize E-rate subsidies for telecommunications discounts during FY 2012.

This concludes the School "B" application data for FY 2012 or E-rate Year 15. The following data will review the BIE consortium data for FY 2012.

BIE consortium application – FY 2012. The DRT revealed BIE applied for E-rate subsidies using one FCC Form 470 linked to three FCC Forms 471. The application process requested three FRNs for Internet circuits totaling $1.6 million followed by a funding commitment of $1.6 million. Funding disbursements for this FY were nearly $1.55 million (USAC, 2018c).

School “A” was included on this application. This FCC Form 470 was the same one used in FY 2009 – a continuation of an existing contract. An interview source confirms the Internet circuit subsidy gained by School “A” was approximately $45,000 dollars for this FY. School “B” was using a third-party circuit and was not included on BIE consortium.

This concludes the BIE consortium data for FY 2012. Because E-rate modernization policy began its roots in 2013 and was finalized during FY 2015, it is important to pause at this stage and review its history. Following this review, the study will continue with application and consortium review of FY 2013 and beyond.

E-rate modernization – FYs 2013 through 2017. E-rate modernization policy began with FCC issuance of its Sixth Report and Order in September 2010 (FCC, 2010a), removing the requirement for technology plans for applicants requesting Category One (Priority 1) services effective FY 2011. Before FY 2011, applicants were required to submit technology plans for all services except basic telephone service (USAC, 2016e).

Three years later, NPRM 1 – Modernizing the E-rate Program (FCC, 2013) implemented ideas for a more effective and streamlined approach to E-rate administration procedures. This NPRM led to NPRM 2 – Modernizing the E-rate Program, distributed a year later. NPRM 2, amongst other directives, instructed USAC “to make the E-rate application process and other E-rate processes fast, simple and efficient…modernizing USAC’s information technology systems” (FCC, 2014a, p. 5). NPRM 2 implemented the EPC online portal, removed the requirement for technology plans beginning in FY 2015, revamped Category One services, and instituted the requirement for Category Two Budgets (FCC, 2014a).

During FYs 2013 through 2014, the demand for Category One services capped available funding dollars, convincing the FCC to order USAC and the SLD to fund only Category One

services during FY 2013 and 2014 (FCC, 2013, 2014a, 2014b). Beginning in FY 2015, E-rate modernization through NPRM 2, amongst other requirements, placed Category Two budget constraints upon applicants.

This concludes the review of E-rate Modernization. The following data will review the application and consortium information for FY 2013.

FY 2013 (July 1, 2013 through June 30, 2014) – E-rate year 16. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2013. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2013. The DRT revealed School "A" applied for E-rate subsidies using one FCC Form 470 linked to two FCC Forms 471 (USAC, 2018c).

Planning. Records indicate School "A" received support from the OCIO E-rate Team. Evidence indicates the School "A" developed a third revision to their technology plan and had it approved through the BIE. This plan covered a three-year period from 2013 through 2016. The plan continued sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies. Additionally, it directed efforts to upgrade campus Internet bandwidth coupled with additional switches and ethernet cable drops. The school had been increasing their use of online learning applications and were expanding student computer labs to accommodate these requirements.

Sources explain the need for increased Internet bandwidth was discussed with the OCIO E-rate Team. This need was coordinated with the BIA Network Operations Center and an

attempt was ongoing to upgrade Internet Circuits. The OCIO E-rate Program Manager assured the school that he would do his best to increase Internet circuit capabilities. As a contingency, an E-rate subsidy request for third-party Internet Access was planned by the school in case the BIA was unsuccessful in its efforts to upgrade bandwidth capability.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate subsidies including Telecommunications, Internet Access for circuit and cell phones, Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared with support from the OCIO E-rate Team.

For Priority II Services (Category Two) –Internal Connections, the FCC Form 470 requested E-rate subsidies for two CISCO or equivalent switches (one 24 port and one 48 port) and 50 new ethernet cable drops. This included battery backup appliances, project management and installation costs (USAC, 2018d).

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, VoIP phone, switch, and wireless access point maintenance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for data plans for existing cell phone service and two USB Port Internet Cards for management laptops. Lastly, they requested a third-party Internet circuit supporting bandwidth up to 20Mbs. This included any associated costs for ancillary equipment to facilitate the replacement of the existing BIE T-1 circuit (USAC, 2018d).

Utilizing. The DRT (Figure 42) shows the funding and utilization figures for FY 2013. No records were available onsite or through the OCIO E-rate Team, but FCDL comments indicated PIA activity and response by the school. School "A" received its FCDL for Priority I (Category One) on November 6, 2013 and Priority II (Category Two) service on March 5, 2014, authorizing initial funding for three Priority I (Category One) FRNs and denial of one FRN, and no funding for the Priority II (Category Two) FRN (USAC, 2018c). The OCIO E-rate Team recommended not to apply for the Laptop Internet cards because it was a duplicate service. The school complied with this recommendation.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2013	3/5/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$10,218.53	INTERNAL CONNECTIONS MNT	$0.00		41
2013	3/5/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$30,001.88	INTERNAL CONNECTIONS	$0.00		41
2013	11/6/2013	NOT FUNDED	FRN canceled in consultation with the applicant.	$18,607.50	INTERNET ACCESS	$0.00		25
2013	11/6/2013	FUNDED		$9,099.32	TELCOMM SERVICES	$9,099.32	$9,099.32	25
2013	11/6/2013	FUNDED		$1,118.66	TELCOMM SERVICES	$1,118.66		25
2013	11/6/2013	FUNDED		$2,255.80	INTERNET ACCESS	$2,255.80		25

Figure 42. Portion of School "A" FY 2013 DRT. Represents a portion of the DRT information for School "A." It demonstrates six funding requests and amounts committed, denied and disbursed for FCDL approval for FY 2013. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates denial of Category Two funding as directed by the FCC (FCC, 2013, 2014a, 2014b). The DRT indicates the FRN for third-party Internet Access was cancelled in consultation with the applicant. According to a source, the BIA was able to increase bandwidth up to 25Mbs for School "A" during the FY. The school received full reimbursement for Local and Long-Distance telephone service, but none for the cellular service or cellular data.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had documentation referencing PIA reviews or reimbursement forms for Telephone and cellular data discounts received that year.

School "A" summary – FY 2013. School "A" was able to apply for and utilize minimal E-rate subsidies during FY 2013. The cellular phone reimbursement scenario existed. The denial of Category Two funding resulted in a loss of $40,000 dollars to the school.

This concludes the School "A" application data for FY 2013 or E-rate Year 16. The following data will review School "B" FY 2013 application data.

School "B" E-rate application – FY 2013. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c).

Planning. Records indicate School "B" received no support from the OCIO E-rate Team. Evidence indicates the School "B" developed a third revision to their technology plan and had it approved through the BIE. This plan covered a three-year period from 2013 through 2016. The plan continued sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies. Additionally, it directed efforts to upgrade campus network topography and capacity through new switches, wireless networking and additional fiber and ethernet cabling. The plan also included the need for new servers that provided email exchange, web hosting, and domain control functions. Fiber and ethernet upgrades were planned throughout to integrate all existing buildings, including the business office into the existing network. School "B" was also increasing their use of online learning applications and were expanding student computer labs and campus facilities to accommodate these requirements.

Applying. The DRT and onsite records revealed that School "B" applied for E-rate subsidies including Telecommunications, Internet Access (third-party bandwidth), Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by the current business manager and technology coordinator (USAC, 2018d).

For Priority II Services (Category Two) – Internal Connections, the FCC Form 470 requested E-rate technologies necessary to upgrade the entire school network subsidies (Figure 43). This included battery backup appliances, equipment storage racks, project management and installation costs (USAC, 2018d).

Internal Connections

Service	Quantity and/or Capacity
Cabling of main school building	Design and install Cable in in main school with Cat6A UTP to BIA standards removal of abandoned cable and equipment
Secure cabinets for telecom equipment	Locking cabinets to fit telcom switches and servers
Servers	Design and install an Email Server, Web Server, DNS Server, DHCP Server, tape backup, KVM, rack mount monitor for servers, and power strips. All servers must be racked mounted.
Switches	1Gbps Ethernet Switches to support new infrastructure with POE and uplinks to other buildings rack mounted.
Wireless	Design and install new wifi solution covering the entire main school, Business Office, Facilities building, Bus Garage, and entire Indian School campus.
Cabling of support buildings	Design and installations of Business Office, Facilities building, Baby Face building, and Bus Garage with Cat 6A cabling, switching in locking racks or cabinets.
UPS	Large scale, hard wired UPS in MDF in the Main School to support all telecom equipment and removal of previous equipment.
UPS	Rack mounted UPS in Business Office, Baby Face Building, Facilities Building, and Bus Garage.
Fiber Optics	New fiber optic installations between the Main School and Business Office, Facilites building, and Bus Garage.

Figure 43. Portion of School "B" FY 2013 FCC Form 470. Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for fiber, existing phone, phone, switches, and firewall appliance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for existing Internet Access with the local telephone company (USAC, 2018d).

Utilizing. The DRT (Figure 44) shows the funding and utilization figures for FY 2013. No records were available onsite or through the OCIO E-rate Team indicating PIA. However, the FCDL comments in DRT data indicated PIA activity and response by the school. School "B" received its FCDL for Priority I (Category One) on October 14, 2015 and Priority II (Category Two) service on July 24, 2014. Both FCDL dates indicate late funding waves.

Priority I (Category One) authorized initial funding for the Local and the Long-Distance and cellular phone FRNs and denied Funding for the Internet Access FRN. It also changed one FRN from Telecommunications to Internal Connections. The denial of Internet Access was caused by faulty contracting procedures by the school. FCDL comments indicated the contract for a new service was signed prior to the expiration of the required 28-day waiting period. No further documentation was available onsite for any of these FRNs.

The DRT indicates denial of Category Two funding as directed by the FCC (FCC, 2013, 2014a, 2014b). The school received most of their reimbursement for Local and Long-Distance and Cellular telephone service.

Accountability. Review of documents onsite at School "B" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had

documentation referencing PIA reviews or reimbursement forms for Telephone and cellular data discounts received that year.

Funding Year	FCDL Date	Commitment Status	FCDL Comments	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2013	7/24/2014	NOT FUNDED	Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	INTERNAL CONNECTIONS	$40,007.70	$0.00		59
2013	7/24/2014	FUNDED	The amount of the funding request was changed from $1,593.95 to $1,137.74 to remove: Ineligible Prorated Charges for $241.43, One-Time Charge for $36, Navigation for $9.99, Music and Games for $9.99, Insurance for $104.85, Ringback Tones for $3.96 and Equipment for $49.99.	INTERNAL CONNECTIONS	$174,220.93	$0.00		59
2013	10/14/2015	FUNDED		TELCOMM SERVICES	$17,214.66	$12,287.59	$11,321.36	101
2013	7/24/2014	NOT FUNDED	Documentation provided during review shows that a contract for the FRN was awarded 3/3/2013, which is prior to the Allowable Contract Date of the FRN, 3/12/2013. A contract for a new service was signed prior to the expiration of the required 28-day waiting period computed from the date of the posting of the FCC Form 470 to USAC's web site which violates program rules and the FRN is denied accordingly.	TELCOMM SERVICES	$14,520.95	$0.00		59
2013	10/14/2015	NOT FUNDED	Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	INTERNET ACCESS	$51,300.00	$0.00		101
2013	7/24/2014	NOT FUNDED	Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	INTERNAL CONNECTIONS MNT	$17,550.00	$0.00		59
2013	7/24/2014	NOT FUNDED	MR1: The category of service was changed from Telecommunications to Internal Connections in accordance with Program rules. <><><><> DR1: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	INTERNAL CONNECTIONS	$115,970.57	$0.00		59
2013	10/14/2015	NOT FUNDED	Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	TELCOMM SERVICES	$17,933.51	$17,933.51	$16,577.48	101

Figure 44. Portion of School "B" FY 2013 DRT. Represents a portion of the DRT information for School "B." It demonstrates eight funding requests and amounts committed, denied and disbursed for FCDL approval for FY 2013. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

School "B" Summary – FY 2013. School "B" was able to apply for and utilize minimal E-rate subsidies during FY 2013. The denial of Category One Internet Access resulted in a loss of $51,300 dollars to the school. The denial of Category Two funding resulted in a loss of $362,270.15 dollars to the school.

This concludes the School "B" application data for FY 2013 or E-rate Year 16. The following data will review the BIE consortium data for FY 2013.

BIE consortium application – FY 2013. The DRT revealed the BIE applied for E-rate subsidies with one FCC Form 470 consortium application linked to three FCC Forms 471. The applications requested E-rate subsidies for Internet circuits totaling $3.2 million followed by a funding commitment of $2.8 million. Funding disbursement for this FY was nearly $2.6 million (USAC, 2018c).

School "A" was included on this application and received an Internet bandwidth upgrade. This FCC Form 470 was a continuation of the Networx contract. An interview source confirms the Internet circuit upgrade to 25Mbs gained by School "A" was worth approximately $65,000 dollars for this FY. School "B" was using a third-party circuit and was not included on BIE consortium.

This concludes the BIE consortium data for FY 2013. The following data will review the application and consortium information for FY 2014.

FY 2014 (July 1, 2014 through June 30, 2015) – E-rate year 17. During this window of time, School "A" applied for E-rate program service subsidies. School "B" applied for E-rate program service subsidies. The BIE applied for E-rate program service subsidies using consortium process. Each entity will be reviewed separately for FY 2014. School data will be organized and reviewed by the primary activities (See Chapter 2) of: planning, applying, utilizing, and accountability, and may be followed by a summary of the funding year.

School "A" E-rate application – FY 2014. The DRT revealed School "A" applied for E-rate subsidies using two FCC Forms 470 linked to two FCC Forms 471 (USAC, 2018c).

Planning. Records indicate School "A" received support from the OCIO E-rate Team. The technology plan continued sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies.

Applying. The DRT and onsite records revealed that School "A" applied for E-rate subsidies including Telecommunications and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared with support from the OCIO E-rate Team.

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for cable, existing server, VoIP phone, switch, and wireless access point maintenance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

Utilizing. The DRT (Figure 45) shows the funding and utilization figures for FY 2014. No records were available onsite or through the OCIO E-rate Team for PIA activity. School "A" received its FCDL for Priority I (Category One) on July 16, 2014 and Priority II (Category Two) service on August 27, 2014, authorizing initial funding for two Priority I (Category One) FRNs and no funding for the Priority II (Category Two) FRN (USAC, 2018c).

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave
2014	8/27/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$6,783.26	INTERNAL CONNECTIONS MNT	$0.00		16
2014	7/16/2014	FUNDED		$10,422.54	TELCOMM SERVICES	$10,422.54	$10,318.58	10
2014	7/16/2014	FUNDED		$3,078.97	TELCOMM SERVICES	$3,078.97		10

Figure 45. Portion of School "A" FY 2014 DRT. Represents a portion of the DRT information for School "A." It demonstrates three funding requests and amounts committed, denied and disbursed for FCDL approval for FY

2014. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

The DRT indicates denial of Category Two funding as directed by the (FCC, 2013, 2014a, 2014b). The school received full reimbursement for Local and Long-Distance telephone service, but none for the cellular service or cellular data.

Accountability. Review of documents onsite at School "A" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had documentation referencing PIA reviews or reimbursement forms for Telephone and cellular data discounts received that year.

School "A" summary – FY 2014. School "A" was able to apply for and utilize minimal E-rate subsidies during FY 2014. The cellular phone reimbursement scenario existed. The denial of Category Two funding resulted in a loss of $6783.26 dollars to the school.

This concludes the School "A" application data for FY 2014 or E-rate Year 17. The following data will review School "B" FY 2014 application data.

School "B" E-rate application – FY 2014. The DRT revealed School "B" applied for E-rate subsidies using one FCC Form 470 linked to one FCC Form 471 (USAC, 2018c).

Planning. Records indicate School "B" received no support from the OCIO E-rate Team. The technology plan continued sustainment through Basic Maintenance of Internal Connection and Telephone service subsidies. The school elected to reapply for network upgrade components lost the previous FY to denial of Category Two funding.

Applying. The DRT and onsite records revealed that School "B" applied for E-rate subsidies including Telecommunications, Internet Access (third-party bandwidth), Internal Connections and Basic Maintenance of Internal Connections. The FCC Form 470 was prepared by the current business manager and technology coordinator (USAC, 2018d).

For Priority II Services (Category Two) – Internal Connections, the FCC Form 470 requested E-rate technologies necessary to upgrade the entire school network subsidies. This included battery backup appliances, equipment storage racks, project management and installation costs (USAC, 2018d).

For Priority II Services (Category Two) – Basic Maintenance of Internal Connections, the FCC Form 470 requested E-rate subsidies for fiber, existing phone, phone, switches, and firewall appliance (USAC, 2018d).

For Priority I Services (Category One) – Telecommunications, the FCC Form 470 requested E-rate subsidies for existing local and long-distance services and existing cell phone service (USAC, 2018d).

For Priority I Services (Category One) – Internet Access, the FCC Form 470 requested E-rate subsidies for existing Internet Access with the local telephone company (USAC, 2018d).

Utilizing. The DRT (Figure 46) shows the funding and utilization figures for Funding Year 2014. No records were available onsite or through the OCIO E-rate Team indicating PIA. However, the FCDL comments in DRT data indicated PIA activity and response by the school. School "B" received its FCDLs for Priority I (Category One) on June 11, 2014 and August 27, 2014. They received their FCDL for Priority II (Category Two) service on August 27, 2014.

Priority I (Category One) authorized initial funding for the Local and the Long-Distance and cellular phone FRNs and for Internet Access FRN. The school received most of their

reimbursement for Local and Long-Distance and Cellular telephone service. The DRT indicates denial of Priority II (Category Two) funding as directed by the FCC (FCC, 2013, 2014a, 2014b).

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Orig Commitment Request	Cmtd FRN Service Type	Committed Amount	Total Authorized Disbursement	Wave	Appeal Wave Number
2014	6/11/2014	FUNDED		$1,435.43	INTERNET ACCESS	$1,435.43	$1,435.39	5	
2014	8/27/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$37,512.90	INTERNAL CONNECTIONS	$0.00		16	
2014	8/27/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$103,218.06	INTERNAL CONNECTIONS	$0.00		16	
2014	8/27/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$167,923.21	INTERNAL CONNECTIONS	$0.00		16	
2014	8/27/2014	NOT FUNDED	DR: Given Program demand, the funding cap will not provide for Internal Connections and/or Basic Maintenance of Internal Connections at your approved discount level to be funded. Please see http://www.universalservice.org/sl/ for further details.	$17,550.00	INTERNAL CONNECTIONS MNT	$0.00		16	
2014	6/11/2014	FUNDED	The establishing Form 470 Application Number was changed at the request of the appellant.	$10,076.40	INTERNET ACCESS	$10,076.40	$8,571.60	5	A02
2014	6/11/2014	FUNDED		$12,751.67	TELCOMM SERVICES	$12,751.67	$11,422.04	5	
2014	8/27/2014	FUNDED		$16,773.70	TELCOMM SERVICES	$16,773.70	$16,535.03	5	

Figure 46. Portion of School "B" FY 2014 DRT. Represents a portion of the DRT information for School "B." It demonstrates eight funding requests and amounts committed, denied and disbursed for FCDL approval for FY 2014. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Accountability. Review of documents onsite at School "B" and through communication with the OCIO E-rate Team provided evidence of minimal accountability systems. The school had paper and electronic files stored onsite of some documents. However, neither site had documentation referencing PIA reviews or reimbursement forms for Telephone and cellular data discounts received that year.

School "B" summary – FY 2014. School "B" was able to apply for and utilize minimal E-rate subsidies during FY 2014. The denial of Category Two funding resulted in a loss of $326,204.17 dollars to the school.

This concludes the School "B" application data for FY 2014 or E-rate Year 17. The following data will review the BIE consortium data for FY 2014.

BIE consortium application – FY 2014. The DRT revealed the BIE applied for E-rate subsidies with one FCC Form 470 consortium application linked to one FCC Forms 471. The applications requested E-rate subsidies for Internet circuits totaling $4.1 million followed by a funding commitment of $4.1 million. Funding disbursement for this FY approximately $3.3 million (USAC, 2018c).

School "A" was included on this application. This FCC Form 470 was a continuation of the Networx contract. E-rate subsidies gained by School "A" were worth approximately $65,000 dollars for this FY. The assumption is School "B" was using a third-party circuit and was not included on BIE consortium.

This concludes the BIE consortium data for FY 2014. The following data will review the application and consortium information for FY 2011 through 2017.

FYs 2015 through 2017 – E-rate years 18 through 20. For FY 2015 through 2017, data will be reviewed for the entire three-year period. E-rate Modernization commenced during FY 2015, and data was gathered from both the DRT and Automated Search of Commitments (ASC). Each of the entities will be reviewed separately for a three -year period.

School "A" E-rate application – FYs 2015 through 2017. The DRT and Automated Search of Commitments (ASC) revealed School "A" applied for E-rate subsidies during each FY in this three-year period (USAC, 2018c, 2019a).

Planning. Records indicate School "A" received no support from the OCIO E-rate Team. In September 2014, they hired a part time Technology Coordinator who has provided their E-rate support since. They also employed a teacher as a part time Technology Assistant. School "A" revised their Technology Plan, directing efforts over the next three years to expand

Wi-Fi usage, upgrade switch technology, maintenance of the existing cable and fiber, and the phase down Telephone discounts.

An additional obstacle, and shortcoming to older COE requirements, was the CISCO switch technology in the school. Because of CISCO pricing, replacing them with less expensive switches was included in the planning. Additionally, the CISCO switches from FY 2008, had outlived their support, so Basic Maintenance was removed from planning. Because E-rate modernization eliminated technology plan approval requirements, this plan was not approved through the BIE.

School "A" decided to continue applying for local and long-distance voice subsidies and cancelled school provided cellular accounts. This was to prepare for USAC's phase down approach to voice subsidies through E-rate modernization. The revision relied on upgrading switch technology to power improved wireless technology, while sustaining existing fiber and reducing existing ethernet cable usage through Wi-Fi expansion. This was the only way the school felt they could effectively use limited E-rate funds. The plan indicated using FY 2015 as the initial phase, and after that E-rate cycle, they would assess costs and remaining funds for following E-rate funding years.

Further review and onsite and discussion with the BIA revealed that the school was provided with a new Domain server during the fall of 2016. E-rate modernization removed servers (except for caching devices) as an eligible component for Category Two equipment in 2014 (FCC, 2014a). This new device assisted the school in replacing the older servers installed during the FY 2008 E-rate application. Lastly, the BIA was able to upgrade the School "A" network bandwidth to 100Mbs during FY 2016. A BIA source indicated successful consortium funding and coordination with LECs allowed this to happen.

Interviews and records indicate during the summer of 2016, School "A" also purchased a new VoIP phone system for approximately $35,000 dollars. This system was a Non-E-rate purchase. NPRM 2 removed Voice appliances from the ESL. They replaced the older CISCO phone system and gained a new system that was user-friendly and could be mostly supported by school technology staff.

Applying. During FYs 2015 through 2017, The DRT and onsite records revealed that School "A" applied for E-rate subsidies including Telecommunications, Internal Connections and Basic Maintenance of Internal Connections. The following sections outline each FY by category of service.

Category two – internal connections. The FY 2015 FCC Form 470 (Figure 47) requested E-rate subsidies for a new switch, 13 Wireless Access Points, Wireless Controller and project management and installation costs. The FY 2016 FCC Form 470 (Figure 48) requested additional switches to replace old CISCO devices purchased with E-rate in Funding year 2008. School "A" did not request Internal Connections in FY 2017 (USAC, 2017j, 2018d).

Category two – basic maintenance of internal connections. The FY 2015 FCC Form 470 requested E-rate subsidies limited maintenance and trips for cable, fiber, switch and wireless controller maintenance. The FY 2016 FCC Form 470 (Figure 48) requested maintenance for just the cabling and wireless controller in order to reduce costs. The FY 2017 FCC Form 470 requested maintenance only for the wireless controller (USAC, 2017j, 2018d).

Internal Connections

Service	Quantity and/or Capacity
1 x 24 Port Gigabit Ethernet Smart Switch, 24 10/100/1000 Ports, PoE and 2 Combo Mini-GBIC Ports - CISCO or equivalent	For Server Room - for main building WIFI expansion
6 x Controlled High Capacity Wireless Access Points - CISCO or equivalent	2 computer labs (main building) a Lab Old Middle School - 2 supporting hallways in main building, 1 in hallway in Middle School
7 x Controlled Wireless Access Points - Medium Capacity - CISCO or equivalent	1 each for smaller modular learning buildings
Include separate quote for installation of Switch, WAPS and Controller	Devices will use existing cabling
Wireless Access Controller - CISCO or equivalent	For Server Room - will connect to all building WAPS - must support 15 or more WAPS

Figure 47. Portion of School "A" FY 2015 FCC Form 470. Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "View 470 information (FY2015 and prior)," by Universal Service Administration Corporation (E-rate), 2018 (http://www.slforms.universalservice.org/Form470Expert/Search_FundYear_Select.aspx). In the public domain.

Category one – telecommunications. The FCC Form 470 requested E-rate subsidies for existing local and long-distance service for all three FYs during this period (USAC, 2017j, 2018d).

Internal Connections and Basic Maintenance of Internal Connections

Category 2: Internal Connections and Managed Internal Broadband Services

Type	Function	Number Entities	Quantity	Unit	Manufacturer	Manufacturer Other Description	Installation and Initial Configuration?	Associated RFP
Internal Connections	Switches		3	Each	Hewlett Packard or equivalent		Yes	
Basic Maintenance of Internal Connections	Cabling	1	120	Feet	No Preference			
Basic Maintenance of Internal Connections	Wireless Controller	1	1	Each	Other	Ruckus Zone Director 1200		

Category Two Narrative

2 x 24 Port Gigabit Ethernet Smart Switches, 10/100/1000 Ports, POE and 4 or more fiber Ports. Will be connected to existing cabling and fiber. Integration with main building and outer building necessary. Fiber already exists in all buildings. CAT 6 cabling exists in all buildings.
1 x 48 Port Gigabit Ethernet Smart Switch, 10/100/1000 Ports, POE and 4 or more fiber Ports. Will be connected to existing cabling and fiber. Integration with main building and outer building necessary. Fiber already exists in all buildings. CAT 6 cabling exists in all buildings.
Include Manufacturer warranty with new equipment
1 trip per year for Cabling and Fiber runs and accessories
Ruckus Zone Director As allowed per E-rate rules

Figure 48. Portion of School "A" FY 2016 FCC Form 470 (EPC Version). Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "E-rate productivity center (EPC)," by Universal Service Administration Corporation (E-rate), 2017 (http://www.usac.org/sl/tools/apply-to-erate/epc.aspx). In the public domain.

Utilizing. The DRT and ASC data below reflect the funding and utilization figures for FYs 2015 through 2017 (Figures 49, 50, and 51). PIA activity was minimal for each year, and the school responded as necessary. School "A" received its FCDL for Category One and

Category Two services each FY authorizing funding as requested. No FRNs were denied over the three-year period.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2015	8/7/2015	FUNDED	This is a new FRN. It was split from FRN 123456. The new FRN contains the following products: Support for ZoneDirector.	INTERNAL CONNECTIONS MNT	$7,170.83	$7,170.83	$7,170.83	11
2015	8/7/2015	FUNDED	Basic Maintenance of Internal Connections FRN was modified from non-recurring charges to recurring charges as required by FCC Rules.	INTERNAL CONNECTIONS MNT	$296.62	$296.62	$296.62	11
2015	7/6/2015	FUNDED		VOICE SERVICES	$5,763.00	$5,763.00	$5,763.00	7
2015	8/7/2015	FUNDED	In consultation with the applicant, this FRN was split to conduct an independent review of the respective products being provided under the FRN. The new FRN is 123456. The products remaining in the original FRN are Installation, Switches, Access Points and Lan Controllers.	INTERNAL CONNECTIONS	$10,611.14	$10,314.49	$10,314.49	11

Figure 49. Portion of School "A" FY 2015 DRT. Represents a portion of the DRT information for School "A." It demonstrates four funding requests and amounts committed and disbursed for FCDL approval for FY 2015. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2016	7/29/2016	FUNDED	MR1:Approved as submitted.	Internal Connections	$7,695.90	$7,695.90	$7,695.90	6
2016	7/29/2016	FUNDED	MR1:Approved as submitted.	Basic Maintenance of Internal Connections	$296.65	$296.65	$296.65	6
2016	7/29/2016	FUNDED	MR1:The FRN was modified from 1 line for $850.39 per month to 19 lines for $44.75 per month to agree with the applicant documentation.	Voice	$5,102.34	$5,101.50	$5,098.79	6

Figure 50. Portion of School "A" FY 2016 ASC. Represents a portion of the ASC information for School "A." It demonstrates three funding requests and amounts committed and disbursed for FCDL approval for FY 2016. Data in figure are adapted from "Automated search of commitments (ASC) tool," by Universal Service Administration Corporation (E-rate), 2019 (https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear). In the public domain.

Accountability. Review of documents onsite at School "A" provided evidence of adequate accountability systems. The school had paper and electronic files stored onsite for all documents. Additionally, access was available for the EPC.

Funding Year	FCDL Date	Commitment Status	FCDL Comment	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2017	7/14/2017	FUNDED	MR1:Approved as submitted.	Basic Maintenance of Internal Connections	$296.65	$296.65	$296.65	7

Figure 51. Portion of School "A" FY 2017 ASC. Represents a portion of the ASC information for School "A." It demonstrates one funding request and amounts committed and disbursed for FCDL approval for FY 2017. Data in figure are adapted from "Automated search of commitments (ASC) tool," by Universal Service Administration Corporation (E-rate), 2019 (https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear). In the public domain.

School "A" summary – FYs 2015 through 2017. School "A" was able to apply for and utilize E-rate subsidies during this three-year period. Planning enabled them to accomplish the first phase of a network upgrade coupled with Category Two budget constraints. This latest upgrade allowed them to increase network capacity by using an improved wireless network and newer switches.

This concludes the School "A" application data for FY 2015 through 2017 or E-rate Years 18 through 20. The following data will review School "B" FY 2015 through 2017 application data.

School "B" E-rate application – FYs 2015 through 2017. The DRT and Automated Search of Commitments (ASC) revealed School "B" applied for E-rate subsidies during each FY in this three-year period (USAC, 2018c, 2019a).

Planning. Records and onsite review indicate School "B" received no support from the OCIO E-rate Team. In 2014, the Technology Coordinator for School "B" took another job and the school was left without technology support. During the 2015 school year, a part-time technology assistant was hired to assist with limited desk-top support.

School "B" had not created an additional technology plan; they maintained the current plan through FY 2016. The existing Business Manager continued E-rate applications, but without the help from the previous Technology Coordinator, she only applied for Category One

services during FY 2015. The business manager noted the existing technology assistant did not know what the school needed for network infrastructure upgrades.

In late 2015, School "B" used a consultant to examine their network and assist them with E-rate. Ultimately, Category Two budget constraints guided them to upgrade switch technology and install improved wireless technology, while sustaining existing fiber and reducing existing ethernet cable usage through Wi-Fi expansion. They decided to continue applying for local and long-distance and cellular voice subsidies, and continued sustainment of Basic Maintenance of Internal Connections.

Further review and onsite and discussion with the BIA revealed that the school communicated with the BIA and requested enrollment into COE. The school was provided with a BIA Internet circuit in the Spring of 2016. This addition upgraded their current 10Mbs third-party circuit to 100Mbs. It also provided them with CIPA filtering through the BIA filtering hubs. Oddly, their request to be enrolled into COE was denied. There were other technology dilemmas discovered during this time period; they will be addressed in the Chapter Four summary.

Applying. During FYs 2015 through 2017, The DRT and onsite records revealed that School "B" applied for E-rate subsidies including Telecommunications, Internal Connections and Basic Maintenance of Internal Connections. The following sections outline each FY by category of service.

Category two – internal connections. School "B" did not request Internal Connections in FY 2015. The FY 2016 FCC Form 470 (Figure 52) requested E-rate subsidies for a new switch, 13 Wireless Access Points, Wireless Controller and project management and installation costs. School "B" did not request Internal Connections in FY 2017 (USAC, 2017j, 2018d).

Category two – basic maintenance of internal connections. School "B" did not request Basic Maintenance of Internal Connections in FY 2015 or 2016. The FY 2017 FCC Form 470 requested maintenance only for the wireless controller, but the ASC indicates it was never filed under FCC Form 471 (USAC, 2017j, 2018d).

Category one – telecommunications. The FCC Form 470 requested E-rate subsidies for existing local and long-distance and cellular service for all three FYs during this period (USAC, 2017j, 2018d).

Category one – internet access. The FCC Form 470 requested E-rate subsidies for existing Internet service for FYs 2015 and 2016. The BIA circuit was in place in 2016, and the school no longer needed this service (USAC, 2017j, 2018d).

Internal Connections

Category 2: Internal Connections and Managed Internal Broadband Services

Type	Function	Number Entities	Quantity	Unit	Manufacturer	Manufacturer Other Description	Installation and Initial Configuration?	Associated RFP
Internal Connections	Wireless Controller		1	Each	Ruckus Wireless		Yes	
Internal Connections	Switches		1	Each	Hewlett Packard or equivalent		Yes	
Internal Connections	WAP		13	Each	Ruckus Wireless		Yes	

Category Two Narrative

1 x 24 Port Gigabit Ethernet Smart Switch, 24 10/100/1000 Ports, PoE and 2 Combo Mini-GBIC Ports - HP or equivalant For Server Room - for main building WIFI expansion - using existing cabling - new WAPS will be tied to this switch
8 x Controlled High Capacity Wireless Access Points - Ruckus or equivalent - using existing cabling
5 x Controlled Wireless Access Points - Medium Capacity - HP or equivalent - using existing cabling
Include separate quote for installation of Switch, WAPS and Controller Devices will use existing cabling
Wireless Access Controller - Ruckus or equivalent For Server Room - will connect to all building WAPS - must support 15 or more WAPS

Project includes, shipping, install, project management, travel, per diem, initial warranty, basic training.

Figure 52. Portion of School "B" FY 2016 FCC Form 470 (EPC Version). Represents the FCC Form 470 categories of service request section for internal connections. Data in figure are adapted from "E-rate productivity center (EPC)," by Universal Service Administration Corporation (E-rate), 2017 (http://www.usac.org/sl/tools/apply-to-erate/epc.aspx). In the public domain.

Utilizing. The DRT and ASC data below reflect the funding and utilization figures for FYs 2015 through 2017 (Figures 53, 54, and 55). PIA activity was minimal for each year, and the school responded as necessary. School "B" received its FCDL for Category One and Category Two services each FY authorizing funding and most disbursements as requested. They

did receive no disbursements for cellular discounts during FYs 2016 and 2017. No FRNs were denied over the three-year period.

Funding Year	FCDL Date	FRN Status	Orig FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2015	9/4/2015	Funded	VOICE SERVICES	$8,952.97	$8,952.97	$8,952.97	15
2015	7/24/2015	Funded	INTERNAL CONNECTIONS MIBS	$1,632.00	$1,632.00	$1,632.00	9
2015	9/4/2015	Funded	INTERNET ACCESS	$10,076.40	$10,076.40	$10,076.40	15
2015	9/4/2015	Funded	INTERNET ACCESS	$1,402.92	$1,402.92	$1,402.92	15
2015	9/4/2015	Funded	VOICE SERVICES	$14,053.20	$14,053.20	$13,271.90	15

Figure 53. Portion of School "B" FY 2015 DRT. Represents a portion of the DRT information for School "B." It demonstrates five funding requests and amounts committed and disbursed for FCDL approval for FY 2015. Data in figure are adapted from "Funding Request Retrieval Tool," by Universal Service Administration Corporation (E-rate), 2018 (https://slpin.universalservice.org/DRT/Default.aspx). In the public domain.

Accountability. Review of documents onsite at School "B" provided evidence of adequate accountability systems. The school had paper and electronic files stored onsite for all documents. Additionally, access was available for the EPC. There is evidence of no reimbursement of cellular funds during FYs 2016 and 2017. The cellular phone reimbursement scenario is indicated.

Funding Year	FCDL Date	FRN Status	Orig FRN Service Type	FCDL Comment for FRN	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2016	7/29/2016	Funded	Voice	MR1:The FRN was modified from 1 line to 45 lines to agree with the applicant documentation.	$9,247.26	$9,247.50	$9,247.50	6
2016	8/6/2016	Funded	Voice - Cellular	MR1:The FRN was modified from 1 line to 16 lines to agree with the applicant documentation.	$4,356.42	$4,356.48		6
2016	7/29/2016	Funded	Data Transmission and/or Internet Access	MR1:Approved as submitted.	$10,076.40	$10,076.40	$10,076.40	6
2016	7/29/2016	Funded	Internal Connections	MR1:Approved as submitted.	$15,231.16	$15,231.16	$14,147.05	7

Figure 54. Portion of School "B" FY 2016 ASC. Represents a portion of the ASC information for School "B." It demonstrates four funding requests and amounts committed and disbursed for FCDL approval for FY 2016. Data in figure are adapted from "Automated search of commitments (ASC) tool," by Universal Service Administration Corporation (E-rate), 2019 (https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear). In the public domain.

Funding Year	FCDL Date	FRN Status	Orig FRN Service Type	FCDL Comment for FRN	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave
2017	9/22/2017	Funded	Voice	MR1:The FRN was modified from 1 line to 45 lines to agree with the applicant documentation.	$5,548.50	$5,548.50	$5,548.50	17
2017	9/22/2017	Funded	Voice - Cellular	MR1:The FRN was modified from 1 line to 16 lines to agree with the applicant documentation.	$2,613.89	$2,613.89		17

Figure 55. Portion of School "B" FY 2017 ASC. Represents a portion of the ASC information for School "B." It demonstrates two funding requests and amounts committed and disbursed for FCDL approval for FY 2017. Data in figure are adapted from "Automated search of commitments (ASC) tool," by Universal Service Administration Corporation (E-rate), 2019 (https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear). In the public domain.

School "B" summary – FYs 2015 through 2017. School "B" was able to apply for and utilize E-rate subsidies during this three-year period. Outside assistance enabled them to accomplish the wireless network upgrade coupled with Category Two budget constraints. This latest upgrade allowed them to increase network capacity by using an improved wireless network and a new switch. They also received BIA Internet circuit upgrade and filtering support through the BIA consortium.

This concludes the School "B" application data for FY 2015 through 2017 or E-rate Years 18 through 20. The following data will review the BIE consortium data for FY 2015 through 2017.

BIE consortium application – FYs 2015 through 2017. The DRT and ASC (Figure 56) revealed the BIE applied for E-rate subsidies for Internet circuit discounts each FY during this three-year period (USAC, 2018c, 2019a).

The FY 2015 application requested E-rate subsidies for Internet circuits totaling $4.8 million followed by a funding and disbursement commitments of $4.7 million. The FY 2016 application requested E-rate subsidies for Internet circuits totaling $22 million followed by a funding commitment of $22 million. Disbursements have only reached $6.3 million at this time. The FY 2017 applications requested E-rate subsidies for Internet circuits with two FRNs totaling

$56.5 million followed by a funding commitment of $12 million. Disbursements have only reached $4.5 million at this time (USAC, 2018c, 2019a).

School "A" was included on all three applications and School "B" was included on the 2016 and 2017 applications. An interview source confirms the Internet circuit upgrade to 100Mbs gained by School "A" was worth approximately $85,000 dollars for all three FYs and the same for School "B" for FYs 2016 and 2017.

FRN Status	Fund Year	Orig Funding Request	Orig FRN Service Type	Wave Number	FCDL Date	FCDL Comment for FRN	Revised FCDL Date	FRN Committed Amount	Total Authorized Disbursement
Funded	2015	$4,808,091.49		27			11/30/2015	$4,705,951.90	$4,705,951.90
Funded	2016	$22,091,078.70	Data Transmission and/or Internet Access	26	12/19/2016	MR1:Approved as submitted.	01/24/2018	$22,091,078.70	$6,292,305.78
Denied	2017			37	1/26/2018	DR1:During the Fiber Review, the applicant provided insufficient documentation to determine eligibility and cost effectiveness of the requested Special Construction Charges. Therefore, this FRN is denied. ||MR1:This is a new FRN. It was split from FRN 1799096943. The new FRN contains the following product(s)/service(s): Lit Fiber Special Construction.		$0.00	
Funded	2017	$34,910,927.33	Data Transmission and/or Internet Access	37	1/26/2018	MR1:FRN modified in accordance with a RAL request.||MR2:The FRN was modified to change the monthly quantity for all line items from 12 to 1 to agree with the applicant documentation.||MR3:FRN Line Item .012 for 1 line of 100Mbps fiber ethernet service was removed from this FRN to agree with the applicant documentation.||MR4:The FRN was modified from $38,789,919.25 to $3,676,171.39 to agree with the applicant documentation||MR5:This FRN is for both Microwave service and Lit Fiber Special Construction and was split in order to conduct an		$3,271,634.30	$841,258.35
Funded	2017	$21,897,980.27	Data Transmission and/or Internet Access	52	5/1/2018	modified from 1Gbps to 1.536 Mbps to agree with the applicant documentation.||MR2:The Upload/Download Speed for FRN Line Item 10 was modified from 50Mbps to 12.288 Mbps to agree with the applicant documentation.||MR3:The Recipient of Service for FRN Line Item 22 was modified from 99172 Lake Valley Navaho School to 65407 NAY-AH-SHING SCHOOL to agree with the applicant documentation.||MR4:The Recipient of Service for FRN Line Item 28 was modified from 98839 Pine Springs School to 209824 PIERRE INDIAN LEARNING CENTER to agree with the applicant documentation.||MR5:The Recipient of Service for FRN Line Item 41 was modified from 98671 Seba Dalkai Boarding School to 95223 ST STEPHENS INDIAN SCHOOL to agree with the applicant		$8,814,052.58	$3,431,660.33
		$83,708,077.79						$38,882,717.48	$15,271,176.36

Figure 56. Portion BIE FY 2015 through 2017 DRT and ASC. Represents a portion of the DRT and ASC information for the BIE". It demonstrates five funding requests and amounts committed, denied and disbursed for FCDL approval for FYs 2015 through 2017. Data in figure are adapted from "Funding Request Retrieval Tool," or the "Automated search of commitments (ASC) tool," by Universal Service Administration Corporation (E-rate), 2018, 2019 (https://slpin.universalservice.org/DRT/Default.aspx) or (https://data.usac.org/publicreports/SearchCommitments/Search/SearchByYear). In the public domain.

This concludes the BIE consortium data for FY 2015 through 2017 or E-rate Years 18 through 20.

Summary of Data – FYs 1998 through 2017. This initial retrieval of data and experiences has revealed the complexities of the E-rate Program experienced by multi-dimensional organizations. After the initial review, the abundance of data required further investigative techniques to develop a comprehensive representation of known processes and interactions. This primarily involved multiple site visits, additional questions, and further reviews of archived records.

The following section or portion of this chapter is a summarization of the data linkage to further the narrative; it is organized by the three research question topics: a) policy and program change influence, b) application process influence, and c) funding influence.

Policy and program change influence on the usage of E-rate. Many policies were initiated early in the early years of the E-rate Program to improve the organization, utilization and expenditures of USAC. Other policies were drafted to provide better oversight of service provider and applicant noncompliance, fraud, waste, abuse, and to improve overall integrity of the E-rate Program. Review and refinement of Eligibility Services Lists (ESL) had to continuously be updated to facilitate the speed of technology change. Though change is often difficult, it is necessary, and many policy changes have refined the program and its usage, providing positive impacts for the greater portion of applicants and integrity of the program. However, E-rate modernization policy, though designed for efficiency and dispersal of funds to a wider range of schools and libraries, does warrant further discussion.

E-rate modernization. E-rate modernization policy included three changes that this study considers significant:

1. Technology Planning.
2. Category Two Budget.

3. Loss of Category Two Funding – FYs 2013 through 2014.

Technology planning. In Chapter Two, research indicated positive aspects of technology planning. Although, a written and approved technology plan is no longer required, the implied task for administrators is to know the entity's needs, which guide the application for services. Additionally, this study has observed a common misunderstanding about organizational technology planning, versus former E-rate technology planning requirements. This researcher believes the E-rate Program is valuable technology support subsidy, and as such, is only a singular component to a more comprehensive organizational technology program.

Though beyond the scope of this study, there is perhaps a middle ground – a need for infrastructure assessments and budgets to determine how E-rate can supplement other dollars needed to comply with ever-changing technology standards. Budgeting for technology was emphasized early in the E-rate Program, in that the "Schools and Libraries Division is not yet emphasizing to schools and districts the need to plan how they will meet ongoing costs" (Carvin, 2000, p. 17). But without organizational technology plans and standards-based technology infrastructure, personnel are left without direction and take their own path or remain complacent.

E-rate modernization directed that technology plans and approvals are no longer required. This study agrees that this is a thoughtful and productive decision. However, this study concludes that there is relevance to using technology assessments and budgeting to better plan and request eligible technology subsidies through E-rate, and budget for non-E-rate eligible technologies. The following examples are presented.

NPRM 2 agreed with commenters and stated the following (FCC, 2014a):

> …we are certain though that, even absent this rule, technology planning will continue to occur because technology has become a central part of school and library infrastructure, and technology planning has become integrated into applicants' core strategic planning. (79)

In this study, School "A" facilitated technology plan revisions even after those needs were not required by the USAC. Their initial technology plan and multiple revisions were often indicative of successful technology decisions, continuity and growth. Their planning is also commensurate with their ability to retain staff. Observations indicate School "A" is the only tribally-operated school on the Pine Ridge Reservation that hasn't experienced drastic shifts in staff over the last ten years.

Between FY 2014 and 2015, School "B" lost their technology coordinator to a better opportunity for employment. The school couldn't compete with the opportunities his training afforded him. In addition, after NPRM 2, the school did not revise their technology plan assessments of infrastructure or costs. They hired a part-time employee for desktop support, but he was unqualified to guide and assist technology and technology infrastructure. By the time they hired a consultant to review their technology infrastructure in 2016, they were in dire shape. They had been disconnected from the BIE Internet and CIPA filtering circuit. For two years, they were unsuccessful in gaining their own E-rate subsidies for Internet Access.

School "B" was also disconnected from any obvious CIPA filtering appliance, and neither student nor teacher computers were under network domain control. The school's academic computers were connected to the Internet without being secured behind a firewall, and none of the computers had anti-virus software installed. Without being under domain control, the machines were accessed via local username and passwords granting various accesses. The business office had purchased a separate server, filtering appliance, anti-virus solution, and Internet connection to control their office. All these purchases were made without E-rate.

The security cameras in the school were in place, but the appliance that controlled the cameras and stored video wasn't present in the school, therefore, the cameras did not work.

Several buildings had their network switches disconnected from the fiber cable and the school's Wi-Fi had no wireless control, thus it worked sporadically. In addition, the third-party Internet access the school was using only delivered 10Mbs.

The principal was new, the old business manager and technology coordinator were gone, leaving no continuity or a revised technology assessment to provide guidance. These deficiencies were eventually addressed and corrected at great expense to the school. E-rate subsidies were also used to facilitate upgrades already mentioned.

The former OCIO E-rate Project Manager commented on the loss of technology planning (Personal communication):

> Without a plan, academic processes will always be at the top, and technology will be at the bottom of Maslow's hierarchy, but technology needs to be at the top to support where a technological society is taking us. E-rate helps drive those costs down; assessment and planning ensure we can use available subsidies, and then we can budget for what those subsidies can't deliver. It's just an unintended consequence. (October 10, 2018)

Although, a written technology plan and technology plan approving process are not a requirement, the literature and the above examples indicate why collaborative planning, assessment and budgeting for technology are vital. Additionally, the evidence supports why top-level educational entities should provide written guidance and visions on how technology and infrastructure standards will support the pedagogical needs of their organizations. In this case study, these organizations would include Tribal Agencies, consortiums such as ONEC, and the BIE in cooperative effort from the BIA information technology support agencies.

Category two budgeting. The FCC directed the Wireline Competition Bureau (WCB) "to monitor the NPRM 2 five-year budget approach and report on its sufficiency and effectiveness" (FCC, 2019, p. 2). The most recent WCB report was published in February 2019 and it recommended that the Commission "retain the category two budget approach and avoid a

return to the prior so-called 'two-in-five rules'" (FCC, 2019, p. 2). This report concludes a higher more diversified participant rate of applicants received equal funding, explaining "the data as showing clear improvements in the way in which funding for internal connections has been administered since Funding Year (FY) 2015 and is supported by the Public Notice comments" (FCC, 2019, p. 2). The original demise of the Two-in-Five rule can be summarized as (FCC, 2019):

> …approach proved to be ineffective for ensuring broad, equitable, and predictable access to funding for internal connections. In most years, the E-rate program could still only provide support for internal connections to applicants with the highest discount rates, which were disproportionately urban schools. From FY2010 to FY2014, applicants below the 89% discount rate received funding only once, in FY2010. In FY2013 and FY2014, no funding was available for category two services. Further, applicants had little certainty that funding for internal connections would be available. (p. 2)

The FCC issued NPRM 2 category two approach primarily as a test. Now that the WCB recommends a continuance, the FCC agrees. This study agrees with equal participation based upon need and level of impoverishment, but not on the funding amounts derived for the most highly impoverished populations. Even though the latest report recommends "raising the funding floor if the Commission finds that insufficient funding is deterring participation by schools and libraries at the funding floor" (FCC, 2019), this amount would not be enough.

In the E-rate Program's infancy, the 104th Congress emphasized the inability of the current marketplace by stating they "acknowledged that the market would not deliver ubiquitous service to poor communities" (Carvin, 2000, p. 8). Underscored in this act was the need to offer services to schools and libraries across the nation that would reduce disparity, affecting entities that were either highly impoverished, located in rural or inner-city settings, or a combination of both (FCC, 1996). Category Two budgeting does provide equal funding based upon the level of

impoverishment per applicants. However, this study concludes the funding cap for highly impoverished rural Indian schools is not enough to fund network infrastructure over five years.

Between FYs 2015 and 2017, School "A" and School "B" were able to use Category Two funding subsidies to replace some aging switches, upgrade their campuses with an improved wireless network and provide funds for limited Basic Maintenance of the wireless controller. These funds were also used to finance project installation and management. During the last conversation with both schools, they verified they have depleted their Category Two funding budgets. School "A" has a Category Two budget of $49,500 dollars and School "B" is $23,250 dollars. Both schools still have aging switches, ethernet cable and fiber. Fiber expenses require trenching between buildings and often under cement. Switches require installation and configuration fees. Both schools have multiple buildings requiring fiber connections and separate switches to facilitate LAN integration with wireless access points, cameras, and phone systems. Neither school can afford highly qualified full-time technology support.

Loss of category two funding (category two funding cap) – 2013 through 2014. "On February 7, 2014, the USAC Schools and Libraries Committee recommended that no Priority II Form 471 applications be approved" at the 90 percent discount level for FY 2013 (USAC, 2014, p. 1). Approved by the FCC, the order was carried. The recommendation was continued for FY 2014, and again approved by the FCC. The results of this policy are beyond the scope of this study, but the impact on the schools in this study and BIE-funded school across the country was arduous. Between FYs 2013 and 2014, School "A" lost $47,003.67 dollars in Category Two funding requests and School "B" lost $688,474.32 dollars in Category Two funding requests.

The former OCIO E-rate Program Manager included statistics for the impact on BIE-funded schools for FY 2013. During FY 2013, there were 215 funding requests for Internal

Connections or Basic Maintenance of Internal Connections totaling $9,246,839.09 dollars. All those requests were denied funding.

Other than the loss of funding, applicants were also impacted by the time and effort dedicated towards planning, applying and responding to PIA reviews for multiple FRNs during these two FYs. The abundance of effort coupled with denial of funding as the E-rate program transitioned to Category Two budget constraints, must have proved disconcerting. The schools in this study, amongst many others were attempting to refresh technology infrastructure from earlier E-rate funding projects.

School "A" had upgraded infrastructure in FY 2008, and School "B" in 2009. The E-rate Program suggests a refresh rate of every five years. In the case of School "B" they were denied funding exceeding $680,000 dollars in 2013 and 2014; this was met with a FY 2015 Category Two Budget of approximately $23,000 dollars.

Application process influence on the usage of e-rate. It is apparent the schools in this study were dependent on the BIE and the ONEC during the first six to nine years of E-rate. During that time, both the BIE and ONEC grappled with the E-rate Application process and program rules to support BIE-funded schools. This may have been one of the reasons the schools in this study, and on Pine Ridge Reservation rarely applied for E-rate. No one was available to interview for periods this early in the study to answer this question. This summary will review each organization beginning with the BIE, followed by ONEC and then each school separately.

BIE application processes and influence of e-rate usage. An excerpt explains the early challenges of the BIA and BIE (personal communication, January 1, 2017):

> The journey began in 1987 when OIEP established the first electronic bulletin board system in the United States devoted to American Indian schools. The Educational

> Native American Network (ENAN) bulletin board was used by principals, teachers and students who shared information, conducted research, and took online classes. Along the way and with some bumps in the road, OIEP was able to reach its goal of having all schools able to access the information super highway in August, 2001. ENAN 2 now connects all 184 schools to each other and the world over a high speed network using both satellite and T-1 technologies. (p. 31)

In 2000, the BIA Greenbook stated "in FY 1999, 98 schools were connected to the Internet and the Bureau proposes to connect an additional 52 schools in FY 2000" (Department of Interior, 2001, p. 62). While members within the BIE were applying for E-rate using consortium applications, other funding sources were being used to catch BIE schools up with current technology trends.

The earliest records available suggest the BIE began planning for E-rate at the same time they were applying for E-rate. For the FY 1998 through 2009 consortium applications, the BIE made 1521 separate funding requests (FRNs) and received zero percent utilization for 1340 of them. The remaining 181 FRNs received approved funding, some or all disbursements have been made.

The BIE struggled each FY and was often denied funding during the PIA process. The most common justifications given for denial of funding were:

1. The BIE couldn't produce Letters of Agency for Schools within the consortium.
2. Schools on the consortium lacked approved technology plans.
3. The BIE could not validate their bid selection process for their Internet Access contract.

During the first several years, the BIE struggled with E-rate processes while attempting to resource trained personnel who could navigate the complexities of the E-rate program. Though PIA reviews were abundant, in time, the BIE recognized their mistakes and initiated actions to correct errors.

The original assumption was that the BIE technology plan included all schools and that BIE-funded schools did not need a Letter of Agency. However, the sovereignty of Tribal and Grant schools meant they had to provide their own technology plan and accept inclusion within a consortium through a signed LOA. Interviews indicate, once BIE management understood this, they informed the schools accordingly.

The bid selection process was a point of contention for the BIE for many years. The original Telecom contract for Internet circuits was through a Government Service Administration (GSA) contracting process. This meant that a government employee within the BIA or Department of Interior procured these contracts through a bid selection process. However, neither the FTS 2000 or FTS 2001 contracts could produce a document showing a fair and impartial selection process when questioned through PIA review.

In 2008, the new BIA OCIO Project Manager communicated with contracting officers in the DOI, BIE and BIA – he was never able to receive a document that said the contracts were fairly awarded. Apparently, the agents that facilitated the contracts were no longer employed or they didn't understand the urgency of the documents. It wasn't until 2009 when FTS 2001 changed over to Networx, that the issue was resolved, and Internet Access subsidies were finally awarded funding.

Another area of concern revealed in this study and not summarized, was duplicate applications or services. Essentially, while the BIE and ONEC were applying for consortium applications between FY 2001 and 2006, they included the same schools on those applications. Had any application reached fruition, the schools on Pine Ridge could have received duplicate services under more than one E-rate application. This is in violation of program rules and can get complicated if USAC and the SLD gets involved during PIA review. It seems someone in

authority of either the BIE or ONEC consortiums should have realized or anticipated this potentiality.

ONEC application processes and influence of e-rate usage. For FY 2001 through 2006 consortium applications, the ONEC made 110 separate funding requests (FRNs) and received zero percent utilization for 100 of them. The remaining 10 FRNs received approved funding, some or all disbursements have been made.

The ONEC struggled each FY and was often denied funding during the PIA process. The most common justifications given for denial of funding were:

1. The ONEC couldn't produce Letters of Agency for Schools within the consortium.
2. The ONEC couldn't verify eligibility of requested services.
3. The ONEC couldn't provide proof to access of funds that covered the non-E-rate portion of the requested funds.

The ONEC likely did not understand the difference between their oversight of the schools as a consortium leader and the program rules required of the consortium members. The tribal schools would have been required to have technology plans and sign a letter of agency for consortium approval. Additionally, ONEC would have to ensure that each school's technology plan contained a technology budget including how they would finance non-E-rate costs (USAC, 2016e). In order to verify eligibility of requested services, a technology plan and documentation from the service provider would have assisted any of these PIA requests. According to the results of funding denial, these conditions or processes never transpired.

Unfortunately, the ONEC was also taken advantage of by NexteraOne essentially ending half a decade worth of coordinated efforts between ONEC and this service provider, and leaving a false image of E-rate on the Pine Ridge Reservation (FCC, 2007).

School "A" application process and influence of e-rate usage.

Planning. School "A" was contacted by and agreed to receive support, initially from the Pine Ridge ELO and then the OCIO E-rate Team. They used this support through FY 2014 and then hired a knowledgeable Technology Coordinator to continue their E-rate subsidy processes. Using E-rate support and hiring knowledgeable employees or consultants assisted School "A" in maintaining continuity and achieving results in their application processes.

They developed technology plans and revised them through FY 2018. Their revisions and technology budgets influenced E-rate usage in a positive manner. Despite losses to Category Two funding during FYs 2013 through 2014 and the E-rate Modernization changes, they have used E-rate to increase classroom connectivity and growth.

Applying. School "A" first applied for E-rate subsidies in FY 2004 and then again, from FYs 2009 through 2017. School "A" made 40 separate funding requests (FRNs) and received funding commitments for 32 of them (Appendix E).

The eight FRNs that denied funding were due to policy decisions, PIA or the school cancelled FRNs they did not need.

In total, seven FRNs were influenced by application processes and influenced E-rate usage.

School "A" received no funding disbursements for five cellular discount FRNs between 2009 and 2014, which resulted in E-rate subsidy losses totaling $19,081.36 dollars. This is due to the cellular phone reimbursement scenario.

School “A” received no funding disbursements for Basic Maintenance of Internal Connections FRNs during FYs 2010 and 2011that delivered FCDL commitments late (AKA Late Waves). This resulted in E-rate subsidy losses totaling $18,944.06 dollars. Essentially, USAC and the SLD likely experienced their own internal issues, which delayed the funding and moved invoicing close or beyond the current FY.

School “A” received no funding disbursements for Basic Maintenance of Internal Connections in FY 2012 due to PIA. The PIA claimed the applicant has not provided sufficient documentation needed to determine the eligibility of the services. No information could be found onsite or through the OCIO E-rate Team. It is concluded that the PIA sent to the school was never received or forwarded to the OCIO E-rate Team. As a result, it went unanswered and the FRN was denied. This resulted in E-rate subsidy losses totaling $11,122.06 dollars.

In total, various application processes between School “A” or Schools and Libraries Division operations impacted seven FRNs and resulted in a loss of $ 49,147.48 dollars in E-rate subsidies (Appendix E).

School “B” application process and influence of e-rate usage.

Planning. School “B” accepted and received sporadic support from the OCIO E-rate Team. They initially used support from the team in 2008 and 2009 for technology planning and enrollment into the BIA COE. However, they never enrolled into COE, and seemed to address most of their needs alone. During the period between 2010 and 2013, they disconnected from the BIE Internet circuit and CIPA filtering. It wasn’t until FY 2014 that they finally received funding for separate Internet access.

Records indicate they never achieved greater than 10Mbs Internet bandwidth and at some point, between 2014 and 2015, had lost the ability to filter content and secure their network.

This was due to losing their former Technology employee, hiring unqualified part-time support, and changeover in administration. During FY 2015 through 2016, they reinitiated contact with the OCIO E-rate Team; coordination allowed them to reconnect to the BIE Internet and filtering service. Though recommendations for COE enrollment were made, upon request, they were denied. School "B" hired a technology and E-rate consultant in 2016 that assisted them in reestablishing a secure network topology and upgrading functionality using E-rate subsidies.

They never revised their latest technology plan from 2013 through 2016, which may have caused some of their disillusion after their technology coordinator left for new employment. Still, despite losses to Category Two funding during FYs 2013 through 2014 and the E-rate Modernization change to Category Two budgeting, they have used E-rate to increase classroom connectivity and growth.

Applying. School "B" first applied for E-rate subsidies in FY 2004 and then through the duration of this study. School "B" made 45 separate funding requests (FRNs) and received funding commitments for 32 of them (Appendix F).

The 13 FRNs that denied funding were due to policy decisions, PIA or the school cancelled FRNs they did not need.

In total, six FRNs were influenced by application processes and influenced E-rate usage.

School "B" received no disbursements for one Telecom FRN in FY 2006 due to an appeal. No information was available to determine circumstances. This resulted in E-rate subsidy losses totaling $ 25,559.60 dollars.

School "B" received no funding disbursements for one Internet Access FRN in FY 2013 because they signed the contract prior to the allowable contract date. The PIA review process administered the decision, suggesting the contract for the FRN was awarded 3/3/2013, which is

prior to the Allowable Contract Date of the FRN, 3/12/2013. The FRN was denied accordingly. This resulted in E-rate subsidy losses totaling $51,300 dollars.

School “B” lost funding disbursements for two cellular discount FRNs during FYs 2016 and 2017. This resulted in E-rate subsidy losses totaling $6,970.37 dollars. The assumption is due to the cellular phone reimbursement scenario.

School “B” lost funding for one Basic Maintenance of Internal Connections FRN during FY 2011 that delivered FCDL commitments late (AKA Late Waves). This resulted in E-rate subsidy losses totaling $9,900.90 dollars. Essentially, USAC and the SLD likely experienced their own internal issues, which delayed the funding and moved invoicing close or beyond the current FY.

School “B” also partially filed in FY 2004 and did not follow-up with FCC Form 471 processing.

In total, various application processes between School “B” or Schools and Libraries Division operations impacted seven FRNs and resulted in a loss of $ 93,730 dollars in E-rate subsidies (Appendix F).

E-rate funding influence on technology and technological infrastructure. The data revealed funding commitments and disbursals for both schools in this study, either as individual applicants or as members of a consortium. Additionally, both schools have experienced E-rate subsidy influence through BIE and ONEC consortium applications for some periods covered in this study. This summary will review each organization beginning with the BIE, followed by ONEC and then each school separately.

BIE e-rate funding influence. BIE influence has primarily been linked to Internet access and the Common Operating Environment. This study assumes, neither School "A" or School "B" had Internet access in 1998 and that in 1999, when the BIE installed T-1 access on their campuses, it was their first computing capable technology. It is likely, that even with a new T-1 in the school, they didn't yet have a LAN, or computers to connect. Until 2002, BIE schools were connected to separate networks.

In January 2002, the BIA and OIEP created the ENAN-2 (Education Network for Native Americans) Technology Plan (personal communication, January 1, 2017). This plan outlined an earlier three-year milestone to supply all BIE-funded schools with Internet circuits and technology infrastructure that connected them to one Network. Investigation could not reveal the exact dates, but according to information obtained during a brief interview, the remaining schools on Pine Ridge received partial T-1 Internet Circuits and switching technology between 2001 and 2003. Tribal and Grant schools maintain sovereignty and have only transitioned to the BIE domain network on their own accord.

Between 1999 and 2008, there was minimal progress for BIE consortium applications, especially for Internet circuits. However, even when the BIE was denied funding for Internet circuits, they still financed the full price of circuits they had installed in the schools. Additionally, when they were successful with E-rate consortium subsidies, they paid for the percentage of the circuit not funded by E-rate subsidies. This is still a primary benefit to schools who maintain a BIE provided Internet circuit.

Beginning in 2009, the BIE began receiving positive funding for their consortium applications linked to their new Networx contract. The positive results are displayed in Figure

57; in addition, phasing is indicated when committed funding amounts exceed commitment requests.

Year	Request	Commitment
2009	$6,507,201	$1,734,259
2010	$1,062,793	$2,557,116
2011	$4,579,002	$3,553,814
2012	$1,683,275	$1,605,824
2013	$2,890,811	$2,802,110
2014	$4,306,763	$4,318,486
2015	$4,808,091	$4,705,952
2016	$22,091,079	$22,091,079
2017	$14,419,348	$3,271,634
2018		
Grand Total	**$47,929,015**	**$43,368,640**

Figure 57. BIE consortium disbursement for Internet access – 2009 - 2017. Represents the BIE Internet circuit consortium funding figures from 2009 through 2017. It also depicts periodic phasing caused by moving circuits from one contract to another over time. From "BIE consortium disbursement for Internet access – 2009 - 2017," by the Bureau of Indian Affairs. [2018] from personal communication, October 9, 2018. Reprinted with permission.

ONEC e-rate funding influence. The ONEC played a minor part in providing E-rate subsidies and components to the schools in this study. During FY 2001, ONEC received funding disbursements of $1,205,192.50 dollars that were used to install a Nortel based phone system connected through a private network and managed from a central location offsite from the schools. These phone systems were integrated into the schools in this study.

As mentioned in the School “B” 2007-2010 Technology Plan, these systems were problematic and needed replaced as soon as feasible. In fact, both schools eventually replaced these systems. School “A” paid for the replacement in full sometime in 2004, and School “B” used E-rate subsidies to replace theirs during FY 2008.

During FYs 2002 through 2006, ONEC was unsuccessful with E-rate consortium applications, and was involved with a Department of Justice investigation and eventual court ruling in 2006. Had they been more aware of E-rate program rules, they may have realized positive funding and experiences with the process. FY 2006 was the last year ONEC involved its schools with E-rate and Technology planning. The schools were left with incomplete

technology infrastructure and a phone system that had to be managed, serviced and financed by the schools through outside sources.

School "A" – e-rate funding influence. School "A" has relied on and received Internet circuit support from the BIE for over 20 years and continues to experience secure Internet access and growth in their bandwidth. The BIE has paid for their bandwidth from at least 1999, either through full payment or through E-rate consortium subsidies. These monies total in the hundreds of thousands of dollars and have allowed School "A" to finance other technology initiatives throughout the period of this study.

During FY 2008, School "A" enrolled in the BIA Common Operating Environment (COE). School "A" remains in a distinct group of only three Tribal schools that remain on the BIE.EDU network domain. Despite some shortcomings, enrollment provides CIPA complaint content filtering, security products such as Enterprise Anti-Virus and Anti-Malware solutions and, Network Servers. Additional benefits include network level support and software patches and free access to software such as Windows Operating Systems and Microsoft Office.

Though the cost of these services cannot be exact, the estimated worth exceeds $70,000 per year for the school. One example is Network support. On average, even a part-time Network Administrator will command $40,000.00 dollars a year. Windows 10 Enterprise Operating System is approximately $150.00 dollars per license. Microsoft Office is another expense. School "A" has over 125 computers and laptops in their inventory. Couple these two prices with server and anti-virus software, the cost continues to rise.

Between FY 2004 and 2017, School "A" filed 40 FRNs for E-rate subsidies requesting services totaling $636,786.99 dollars (Appendix E). They were committed $509,782.12 dollars in funding for 34 FRNs and denied funding for six FRNs. They received authorized

disbursement of funds for $340,294.95 dollars, of which, $219,514.99 dollars were disbursed and utilized for upgrading the technology infrastructure of the school.

During FY 2008, School "A" used a combination of E-rate funds coupled with an Enhancing Education Through Technology (EETT) Grant application (A. 2009a) to upgrade their network and technology capabilities. During FY 2008, School "A" was able to install a new network facilitating the connectivity of at least 8 direct connected computers per classroom and was more capable to manage all computers and devices requested through the EETT Grant. They received needed discounts for telephone services, and they were able to meet the requirements of enrollment into the BIA Common Operating Environment (A. 2009a).

Between FYs 2015 through 2017, despite Category Two budget constraints, School "A" phased out older wireless and switch technology and increased network capacity by installing an improved wireless network and newer switches.

School "B" – e-rate funding influence. School "B" used BIE Internet circuit support until 2010. At some point between 2010 and 2011, they disconnected from the BIE T-1 and had a third-party circuit installed. They requested E-rate subsidies for this new circuit beginning FY 2011 but didn't get funding until FY 2014. For FY 2014 through 2015, they received funding disbursements of $18,648 for their third-party Internet circuit (Appendix F).

During FY 2016, School "B" reinitiated contact with the OCIO E-rate Team and reconnected to BIE provided bandwidth. At that time, they received a new Internet circuit providing 100Mbs bandwidth and CIPA compliant filtering. For most of the period covered in this study, School "B" has relied on and received support from the BIE for Internet bandwidth and CIPA filtering. The BIE has paid for their bandwidth from at least 1999 to 2010 and 2016 to present, either through full payment or through E-rate consortium subsidies. These monies total

in the hundreds of thousands of dollars and have allowed School “B” to finance other technology initiatives throughout the period of this study.

Oddly, School “B” was denied enrollment into the BIA Common Operating Environment (COE) in 2016. When they reconnected to the BIE circuit in 2016, their request for enrollment was denied by the BIA. Without enrollment into COE, School “B” is unable to be a member of the BIE.EDU domain and receive other included benefits.

Between FY 2004 and 2017, School “B” filed 45 FRNs for E-rate subsidies requesting services totaling $1,390,951.44 dollars (Appendix F). They were committed $558,804.93 dollars in funding for 32 FRNs and denied funding for 13 FRNs. They received authorized disbursement of funds for $462,836.92 dollars, of which, $211,178.45 dollars were disbursed and utilized for upgrading the technology infrastructure of the school.

School “B” was able to apply for and utilize E-rate subsidies during FY 2008 to install a new Avaya phone system. During FY 2009 they used E-rate subsidies to install a new network facilitating the connectivity of their classroom and staff computers. They received needed discounts for telephone services and Basic Maintenance of Internal Connections.

Between FYs 2015 through 2017, despite Category Two budget constraints, School “B” was able to apply for and utilize E-rate subsidies during this three-year period. E-rate subsidies allowed them to increase network capacity by installing an improved wireless network and a new switch. They also received BIA Internet circuit upgrade and filtering support through the BIA consortium.

Summary

This Chapter demonstrates the complexities involved in multi-echelon organizations seeking a federal subsidy for technology services over twenty years. In her book, Servon wrote:

"First, technology (and the digital divide in particular) is a moving target…Second, the range of material that I needed to understand and include expanded endlessly" (Servon, 2002, pp. 86-90). The two schools in this study working within the span of control of the BIE and briefly with ONEC, demonstrate Servon's analogy.

The fevered pace of the computing age is no secret. Since the first IBM computer rolled out in 1981, technology innovation has become "one of the most remarkable, rapid, and significant technological transitions in history" (Chapman et al., 2000, p. 1). Since 1998, the organizations in this study have been lured to the E-rate program and have demonstrated a race to provide funds for telecommunications services and simultaneously, have been held responsible for keeping up with enormous technology infrastructure and delivery changes that effect E-rate Policy, application processes, and funding.

Chapter 5: Findings

The study sought to develop a comprehensive understanding of the real-world issues encountered by applicants attempting to realize opportunities available through the E-rate program. This study sought to determine how E-rate policy change, application process change, and funding influences E-rate usage and technology, and hopes to inform schools, stakeholders and policymakers how to better manage and derive benefit from this powerful funding source.

This study examined twenty years of data and experiences of two small BIE-funded schools and their top-level organizations. The abundance of information provided empirical findings for the research questions, and offered insight into other areas outside of this study's scope of investigation. Table 1 summarizes the significance of the three research questions resulting in the data, information and experiences gathered in Chapter Four and will be followed by more detailed information. Other noteworthy perceptions, summarized in Table 2, are the focus of recommendations to the FCC, the BIE and BIA, and BIE-funded schools. Table 2 will also be followed by detailed information. This chapter will also include personal reflections and observations, limitations, and recommendations for further study.

Table 1

Research Question Significance

RQ1: How has the nature of the FCC E-rate Policy and Program change influenced the usage of E-rate?
• E-rate Modernization directive for Category Two budgeting has constrained the usage of eligible Internal Connection service subsidies to the most highly impoverished schools and ethnic groups in the United States. • E-rate Modernization omission of technology planning and approval may perhaps hinder emphasis on planning for technology infrastructure and growth.
RQ2: How has the nature of the FCC E-rate Application process influenced the usage of E-rate?
• The complexities of the E-rate application process adversely influence the usage of E-rate by impacting the receipt of funding. • Complexities of top-level consortium applications may have disenfranchised consortium members; preventing planning for Internal Connection infrastructure. • Data suggests a learning curve for applicants and USAC and the Schools and Libraries Division.
RQ3: How has the nature of the FCC E-rate funding influenced technology and technological infrastructure?
• Funding for technology should be devised to ensure funds are used to favor the best return on investment for all parties concerned. • E-rate subsidies do have a positive influence on the technology and technology infrastructure.

RQ1: How has the Nature of the FCC E-rate Policy and Program Change Influenced the Usage of E-rate?

This study concludes that E-rate Modernization has constrained the usage of eligible Internal Connection service subsidies to the most highly impoverished schools and ethnic groups in the United States. This study also concludes E-rate Modernization omission of technology planning and approval may perhaps hinder emphasis on planning for technology infrastructure and growth.

Many schools on the Pine Ridge Reservation are aging facilities in need of replacement or high dollar renovation. These communities are poor and disparate, separated from employment opportunities and lack infrastructure. Many reservations in the United States were placed far away from their neighboring non-Indian communities. The latest BIE Strategic Direction indicates Indian schools remain behind the rest of the nation in terms of poverty, educational progress and facilities (DOI/ED Indian Education Study Group, 2018).

E-rate Policy seems to have moved from its original intent – providing subsidies to the most highly impoverished, to ensuring equal disbursements of funds to everyone. Category Two budgeting has allowed all applicants a portion of FCC subsidy funding by reducing the amount of funding to the neediest schools in the United States. This study does not argue the new intent, but concludes new intentions are not as beneficial to Indian Schools and possibly other highly impoverished communities. An excerpt from the BIE Strategic Plan states (DOI/ED Indian Education Study Group, 2018).

> As part of the government-to-government relationship with Indian Tribes, the United States has a trust and treaty responsibility to provide eligible Indian students with a quality education that reflects the unique cultural, geographic, and socio-economic circumstances of Indian Country. (p. 1)

Within the pages of this plan, President Trump echoes these comments and commits his administration to the improvement of Indian Country.

Pine Ridge Reservation shares some of the highest per capita impoverishment in the United States. This can be said for most of the Native American Tribes in the United States. It might be prudent for policymakers to review E-rate subsidization against the actual technology needs of Indian schools.

The FCC believes that Technology Planning has "become a central part of school and library infrastructure, and technology planning has become integrated into applicants' core strategic planning" (FCC, 2014a, p. 79). This study concludes that technology planning and assessment provides a means of establishing technology culture, progress and direction for schools, educational administrative entities and policymakers. Technology assessments should be used to request and use E-rate subsidies in the most highly impoverished schools in the nation, particularly, Indian schools funded by the BIE. But technology planning must be understood in light of the overall school needs, which have a survival urgency to them. The School "A" Superintendent expressed it this way: "Technology planning simply doesn't get the opportunity to be at the top of the priority list, we are just trying to make sure our students get fed" (Personal communication, July 10, 2018).

This study agrees that "the burden of getting formal approval and certification of these technology plans outweighs the benefits to the program" (FCC, 2014a). However, this study also concludes that planning for technology does not always take place, and that educational entities should be required to assess technology infrastructure and plan for future innovations. Every person relies on technology to communicate and navigate through life, school and employment. Ideally, the FCC E-rate Program should be able to facilitate the review of

technology infrastructure and assessment for highly impoverished applicants, in order to genuinely subsidize those needs.

Everyone in this study is influenced by Policy – From the FCC to the USAC and the Schools and Libraries Division, down to the applicant. Policy gains momentum from input, which prioritizes and often majorizes the needs of the many, which in turn can minimize the neediest. A key ingredient to the text, could possibly be explained as a need to develop better cultural awareness and appreciation for Indian Nations within the United States.

RQ2: How has the Nature of the FCC E-rate Application Process Influenced the Usage of E-rate?

This study concludes that the complexities of the E-rate application process adversely influence the usage of E-rate by impacting the receipt of funding. It is apparent that the schools in this study were dependent on the BIE and ONEC during the first six to nine years of E-rate. During that time, both the BIE and ONEC grappled with the E-rate Application process and program rules to support BIE-funded schools. The E-rate application process required the BIE and ONEC to reinvent their normal operations and coordinate E-rate efforts with the BIA, service providers, BIE-funded schools, and contracting agencies to support an ever-changing direction in technology.

The BIE struggle took ten years before it managed to organize efforts and receive funding for Internet Access circuits and CIPA filtering for their schools. Fortunately, for the schools in this study and others, Internet Access and CIPA filtering was provided at full cost from the BIE and BIA, whether E-rate subsidies were funded or denied.

Though ONEC experienced many of same challenges as the BIE, and ultimately, gave up seeking E-rate subsidization for their schools. Though cheated by a nefarious service provider,

they were still responsible to take some responsibility for the situation – understanding the E-rate program rules to some degree could have prevented this situation. As a result, the schools on Pine Ridge were left with unfinished work and the E-rate program's reputation suffered.

Unfortunately, during the first nine years of the E-rate Program, the schools in this study rarely applied for E-rate subsidies, other than for telephone service discounts. While the BIE and the ONEC oversaw E-rate efforts, School "A" and School "B" seemed disenfranchised; instead, they could have been planning and applying for needed Category Two technology infrastructure subsidies to improve their conditions.

Later in the life of the E-rate Program, School "A" and School "B" experienced both challenges and success as well involving the PIA review process, reimbursement procedures, and contracting rules, which affected their ability to receive full disbursements on their funding requests. Additionally, late funding waves from USAC eliminated some funding for Category Two funding requests.

Often, these two schools experienced funding disbursements when the application process was followed and when they received support from the OCIO E-rate Team. Additionally, hiring knowledgeable staff or consultants improved their ability to plan their technology needs and apply for and obtain of E-rate funding.

The data also suggests a learning curve. Over time, the BIE and the schools in this study increased their ability to plan, apply, and utilize E-rate subsidies more efficiently. For instance, once the BIE and BIA renegotiated the telecommunications contract in 2009, they continued to receive necessary subsidies for Internet Access and bandwidth growth for many BIE-funded schools. School "A" and School "B" continue to enjoy this Internet Access and bandwidth growth today.

The USAC and Schools and Libraries Division have also experienced growth and have made changes over the last twenty years to improve the application process. The data from Funding Year 2015 through 2017 demonstrates the online portal (EPC) has resulted in many improvements. Primarily seen in this study, are enhancements in application procedures, funding wave turn-around times, reimbursement procedures, and a higher percentage of funding approvals.

The BIE is the only federal entity that regularly participates in the E-rate program. The reality is that the BIE supports over 48,000 students across 23 states encompassing a myriad of different tribal cultures and languages. This responsibility is guided by federal law upholding educational obligations to Indian Tribes and their eligible Indian students. Because of this wide span of responsibility encompassing multiple states, tribes, cultures, and languages, more emphasis should be placed on the communication between the Bureau of Indian Education and the gatekeepers of the E-rate Program. This will assure better understanding of E-rate Program rules and processes for Indian communities

RQ3. How has the Nature of the FCC E-rate Funding Influenced Technology and Technological Infrastructure?

This study concludes E-rate funding must be well planned in order to positively influence technology and technology infrastructure. Though funding for technology creates the resources for infrastructure, the path should be devised to ensure funds are used to favor the best return on investment for all parties concerned. This study reviewed several examples of funding approvals, each with assorted outcomes. For instance, School "A" planned to combine E-rate subsidy outcomes with the EETT grant, allowing them to realize a full network upgrade with necessary classroom technology over a two-year period. School "A" was also able to capitalize

on BIE provided Internet access and enrollment into a common operating environment, saving the school thousands for dollars over time.

In this study, the BIE has used E-rate funding to increase Internet Access funding for over 160 BIE-funded schools for over twenty years. Though coordinating these efforts has been complicated, over time, necessary bandwidth and growth has been the result.

This study also reveals another top-level organization that received some funding very early during in the E-rate Program. The ONEC funding created a means to install a complicated telephone system in the schools in this study. The infrastructure only complicated operations, and the burden of the equipment's operation and maintenance ultimately fell to these schools. Though, because the schools did receive funding for a working phone system, this example could be perceived as a mixture of positive and adverse developments caused by E-rate funding. Technology funding itself is interconnected with a variety of monies dedicated to other operations necessary to facilitate educational progress, facility improvement, transportation and a myriad of other needs. Because funding is drawn from multiple sources that must be combined and coordinated, it requires assessment and planning to ensure organizations can achieve the best return on investment. In this cases study, funding for E-rate interacts with funding for technologies E-rate does not subsidize. These include network components and end-user devices that deliver pedagogy and operational information to the administrator, teacher and student.

This study also demonstrated how two schools took advantage of the receipt of services through E-rate subsidies and improved their technology and technology infrastructure over time. These improvements were not without challenge, and each school drew different conclusions and were directed down different paths. This study suggests that E-rate subsidies have made a

positive influence on the technology and technology infrastructure for the schools in this study and for their staff, students and stakeholders.

Additionally, because of the enormous span of control the BIE must exercise with 183 schools across 23 states, there exists a need for better understanding by federal policymakers to ensure highly impoverished Indian communities are fully supported by federal subsidies available through the E-rate Program.

Recommendations

Other noteworthy perceptions, summarized in Table 2, are the focus of recommendations to the FCC, the BIE and BIA, and BIE-funded schools and will follow Table 2.

Table 2

Noteworthy Perceptions and Recommendations

Recommendations for the FCC
• Reexamine the original intent of bridging the digital divide through federal subsidization - provide more monies to the highly impoverished. • Coordinated assessment to supplement Category Two Funding.
Recommendations for the BIE and BIA
• Develop better collaborative policies amongst themselves and the schools and Tribes receiving BIE-funded support. • Data suggests tribally-operated Schools are not receiving top-level technology guidance; if so, how are Tribally-Operated Schools working alone, or are their examples of other schools working with the tribes or other administrative authorities? • The BIE ENAN network supported by the BIA provides adequate bandwidth and a secure CIPA environment. All BIE-funded schools should be allowed to enjoy its functionality and security.
Recommendations for BIE-funded Schools
• BIE-funded schools, especially tribally-operated schools request support and guidance for technology infrastructure. • Collaborate, form coalitions or school consortia allowing resource sharing and development of a common technology infrastructure standard you all agree upon. • Assess technology infrastructure and bandwidth needs. Review school budgets and determine what monies are set aside each school year to purchase technologies not funded subsidized through E-rate.

Recommendations for the FCC

This study recommends that the FCC reexamine the original intent of bridging the digital divide through federal subsidization. In Indian Country, that gap is certainly still there. In our country, the distribution difference of income and wealth are ubiquitous, and yet, our policies transgress in order to "provide something for everyone" (Peters, 2012, p. 20). Perhaps this

balance of funding will only create an additional necessity for other government resource streams to facilitate this new paradigm. In this example, when policy is influenced to ensure every E-rate applicant receives subsidies, a larger need transcends, possibly creating other policies to counteract the causation of the equal treatment.

Perhaps, an examination could be done in conjunction with the FCC, its Office of Native Affairs and Policy and technical advisors from the BIA and BIE. A possible scenario might involve developing methodologies that could review technology assessments from highly impoverished schools once during every five-year Category Two funding cycle. Use that assessment to secure additional monies to assist the schools in obtaining subsidies to refresh network topology infrastructure, including cabling, fiber, switching and retrofitting as necessary. These funds could be pooled from other sources or a fixed dollar cap could be established. This would eliminate the need for an approved technology plan and would not interfere with the normal Category Two budget cycle for schools not in a highly impoverished population.

Recommendations for the BIE and BIA

This study recommends that the BIE and BIA develop better collaborative policies amongst themselves and the schools and Tribes receiving BIE-funded support. These policies could address better availability of similar network topographies and technologies that provide predictable delivery to the classroom. This would simplify the process schools use to apply for E-rate subsidies for Internal Connections.

There is a difficult to define obscurity with respect to the schools on the Pine Ridge Reservation, and the sometimes parallel and overlapping responsibilities between the BIA, the BIE and local Tribe. The latest technology plan (Master Technology Plan) from the BIE ended in 2010, and the BIA has no public records of technology standards for BIE-funded schools.

Though tribally-operated schools operate with a degree of sovereignty, the Tribe has shown no involvement in technology oversight. ONEC is still an active coalition but has not provided technological guidance since 2006.

Schools in South Dakota adhere to state level technological and educational standards. BIE schools adhere to educational standards accepted by the BIE and in conformity with standards of the state where they operate. Between the BIE, BIA and the Oglala Sioux Tribe, there is no found direction for technology support for pedagogical growth. The study revealed evidence of such guidance from the BIE and BIA prior to the changes made by NPRM 2. This study has also reviewed justifications and literature that supports why top-level educational entities should provide written guidance and visions on how technology and infrastructure standards will support the pedagogical needs of their organizations.

When a tribally-operated school requested permission to be enrolled back into COE, the request was denied. The BIA simply would not allow them back in. There is likely an explanation for this, but none surfaced in the interviews in this study. A Pragmatist would ask – when and why did the BIE and BIA cease support of their tribally-operated Schools? And, if this is fact, do these sovereign tribal schools have a support mechanism, such as a functioning district headquarters or SEA to ensure they are offered and receive the guidance and support they need? Are their examples of other tribally-operated Schools being supported by their tribes or other administrative authorities? If so, would these examples offer methodologies to the schools on the Pine Ridge Reservations or other schools without technology support and guidance?

The tribally-operated schools appear to have no district or State Education Agency providing them guidance and support for technology. There are Tribal schools on the Pine Ridge reservation that are in dire need of outside support and guidance. They lack qualified network

technicians and learning technologists. There are literally on their own, lacking a support and professional development community.

During the time period between 2008 and 2009, the BIA infused the idea and implementation of the Common Operating Environment. Ultimately, COE became a requirement for the Enhancing Education Through Technology Grant. Many schools opted in, but only the most competitive grants were accepted, resulting in non-enrollment for the rest. The idea behind COE was further diluted when the BIA decided not to support CISCO phones. Schools that had them were left without support. Additionally, circuits could not handle the bandwidth required of the schools, so many disconnected from BIE circuits. The rush to adopt COE as an innovation only increased the amount of disconnect between the BIA and the BIE - thus impacted the schools directly or indirectly. Most innovations take years to implement and to become accepted.

The BIE ENAN network supported by the BIA provides adequate bandwidth and a secure CIPA environment. All BIE-funded schools should be allowed to enjoy its functionality and security. The BIA and BIE should consider reducing COE component requirements from CISCO, so the BIE.EDU Network Domain is available to everyone.

Recommendations for Indian BIE-funded schools

This study recommends that BIE-funded schools, especially tribally-operated schools request support and guidance for technology infrastructure. Schools on the same reservation should collaborate with and help one another within their Tribe. Form coalitions or school consortia allowing resource sharing and development of a common technology infrastructure standard you all agree upon. This would give the opportunity to that share expenses, and contract qualified personnel to assist in network administration and in development of learning

technologies to support pedagogical growth and testing and E-rate administrative requirements. This will schools to hire qualified desktop support and technology mentors and share expenses for the high-dollar positions such as network administration and learning technology specialists.

Assess technology infrastructure and ensure schools have a current diagram of network topology and bandwidth needs. Review school budgets and determine what monies are set aside each school year to purchase technologies not funded subsidized through E-rate.

Limitations

This study targeted a micro version of a distinct population in one of the most highly impoverished regions of the United States, reviewing E-rate Program experiences and impacts on that population. It is likely these experiences parallel schools in similar populations within this country. It is also likely these experiences have no relevancy to populations who do not experience high levels of impoverishment. This limits the generalizability of the study.

This study was limited to available data, interviewees, and time. It is unfortunate that no one was available to interview concerning the time periods between 1998 and 2000. It would seem conducting a study of all the BIE-funded schools on the Pine Ridge Reservation may have produced more validity. However, time constraints and the abundance of data over 20 years limited this study to only two schools.

Finals Thoughts

This study has been a wonderful exploration of the intricacies of multi-dimensional organizations coupled with the complexities of seeking federal subsidies through the FCC E-rate Program. Although the study includes numerous recommendations, its summative or overarching conclusion is that we need to develop a greater acculturation and contextualization of federal and state agencies to our Native American schools and stakeholders.

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APPENDIX A

Interview Process

Using the online data retrieval tool, I determined whom to initially interview and will be able to formulate an investigative narrative for each E-rate program year outside of the general questions for each participant. Questions were categorized into the processes I outline in my proposal and are tied to the three research questions either singularly or they are linked to more than one research question.

The people interviewed were administrative or support members of the two case-study schools examined in the study. Persons were also agents of State Education Agencies (South Dakota), Bureau of Indian Education, or Burau of Indian Affairs.

Empirical data was collected and compared from national, state, and local sources which reflect the E-rate application process, funding commitments, actual funding disbursements, and the human experiences realized or perceived. This data is freely available to the public domain from various search tool databases provided by the Universal Services Administrative Company. Locations of these tools can be found at the following website:

http://www.usac.org/sl/tools/default.aspx

General information gathered on participants:

Demographics:

1. What positions have you held in the schools of this study or in support of them?
2. Have you held any other positions in support of E-rate?
3. What duties would you say impacted the E-rate process in the schools of this study or in support of them?
4. How many years have you worked with the FCC E-rate program?

5. What program year did you first work in support of E-rate (from 1998 to present)?
6. Do you know anyone else I should seek out to assist with this study and why?

Planning for E-rate: (RQ2 and RQ3)

1. Have you ever been involved in any part of a school's technology pan in support of E-rate when a plan was a part of the process? (Technology plan no longer necessary after 2014).
2. Explain the E-rate planning process in your own words please?
3. Can you briefly explain your feelings or experiences with the E-rate planning process?
4. How important do you think planning is for the E-rate process and funding, and why?

Applying for E-rate: (RQ2 and RQ3)

1. Have you ever been involved in any part of a school's E-rate application process?
2. Are you familiar with any of the application process changes that have occurred over the years?
3. Can you briefly explain your feelings or experiences with the E-rate application process?
4. Has the application process impacted your ability to receive E-rate funds?
5. Has the application process impacted your ability to not receive E-rate funds?

E-rate Review Process: (RQ2 and RQ3)

1. Have you ever been involved in any part of a school's E-rate review process?
2. Can you briefly explain your feelings or experiences with the E-rate review process?
3. Has the E-rate review process impacted your ability to receive E-rate funds?
4. Has the E-rate review process impacted your ability to not receive E-rate funds?
5. Have you experienced an E-rate review audit or Cost effectiveness review?

E-rate Funding and Utilizing Funding Process: (RQ2 and RQ3)

1. Have you ever been involved in any part of a school's E-rate funding process?
2. Can you briefly explain your feelings or experiences with the E-rate funding process?
3. Have you been involved with positive E-rate funding and how did it impact your school or schools you supported?
4. Do you remember what telecommunications services the E-rate subsidy funding provided for you and how these subsidies impacted your school in a positive or negative manner?
5. Do you think the amount of E-rate funding is adequate or inadequate for Native American Schools and why?
6. Do you recall if you were ever denied funding for E-rate and why?
7. After receipt of E-rate funding, do you recall the process involved in utilizing that funding, such as filing invoicing or reimbursement documents?
8. Have you experienced any negative aspects of utilizing funding that you can recall?

E-rate Policy Impacts: (RQ1)

1. Are you familiar with a policy change that has impacted the E-rate process in a positive or negative manner and why?
2. Do you recall if you were ever denied funding after you applied for E-rate and if it was due to any particular policy decision?
3. Are you familiar with E-rate 2.0 – the new methodology of E-rate conversion to a dedicated online portal and Category Two funding changes effecting the amount of money available to schools based upon enrollment?
4. Can you briefly explain your feelings or experiences with the E-rate policy changes?
5. Have you experienced any negative aspects of utilizing funding that you can recall?

General Thoughts on E-rate: (RQ1, RQ2, and RQ3)

1. Can you review any areas about the E-rate process that you believe might have an impact on this study and to the improvement of E-rate Policy, application or funding process?
2. If you could offer any advice to E-rate applicants, what would it be?
3. Have you used E-rate consultants to assist you with the E-rate process and what are your feelings of this practice?

Detailed Questions:

Questions for participants will be linked to the program years they were involved in. A general example was to ask them investigative questions about a program years' worth of data headers that tells a story about:

1. What they applied for and why?
2. What they did not apply for and why? For instance, they might have applied for telephone discounts and not internal connections. It would be important to this study to determine why they did not apply for infrastructure or Internet bandwidth. Maybe it was their first year and it seemed overwhelming. Maybe they were part of a larger consortium that was applying for bandwidth and internal connections. That would lead me to that application to determine what the consortium members applied for and what the schools in this study did or did not receive as a result.
3. Why were they denied funding? A data header might say they were denied funding for failure to provide information to a review or they asked for ineligible products or some other reason. This situation will be discussed to determine what processes in the E-rate cycle were

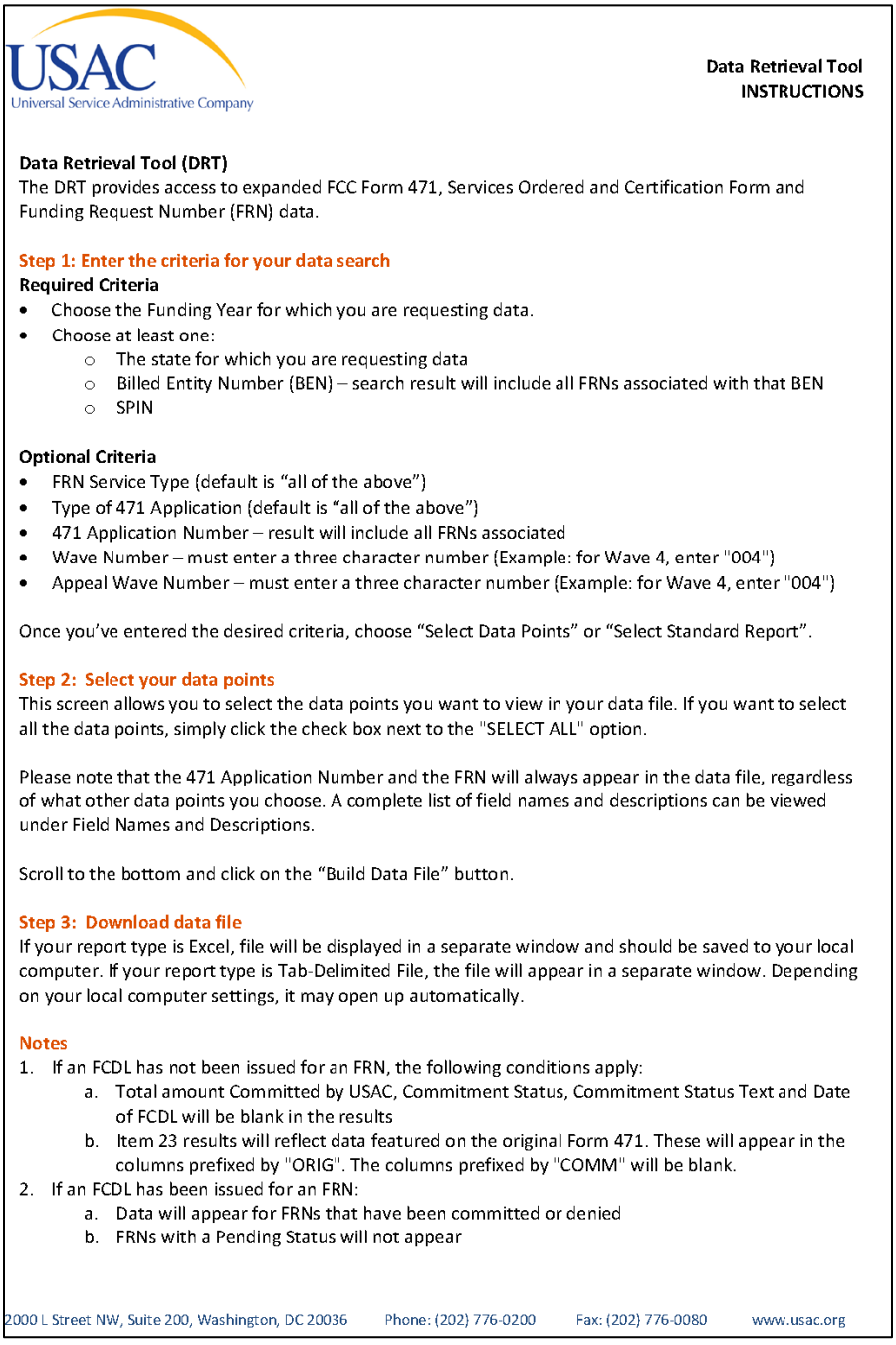
a cause and how it links to the research questions. If they did not return documents for a review, it likely applies to Research Question 2 (Application Process).

4. Denied funding for lack of funds? During several years, the FCC ran out of money and made a determination to only fund category one services. This might have been a year the participants school(s) applied for thousands of dollars' worth of internal connections to upgrade their network. This case would link to Research Question 1 and 3 (Policy and Funding).

APPENDIX B

Data Retrieval Tool Instructions and Data Analysis Explained

A brief explanation of each header and description is categorized and quoted below from the USAC DRT Instruction document (USAC, 2018a).



USAC
Universal Service Administrative Company

Data Retrieval Tool
INSTRUCTIONS

Data Retrieval Tool (DRT)
The DRT provides access to expanded FCC Form 471, Services Ordered and Certification Form and Funding Request Number (FRN) data.

Step 1: Enter the criteria for your data search

Required Criteria

- Choose the Funding Year for which you are requesting data.
- Choose at least one:
  - The state for which you are requesting data
  - Billed Entity Number (BEN) – search result will include all FRNs associated with that BEN
  - SPIN

Optional Criteria

- FRN Service Type (default is "all of the above")
- Type of 471 Application (default is "all of the above")
- 471 Application Number – result will include all FRNs associated
- Wave Number – must enter a three character number (Example: for Wave 4, enter "004")
- Appeal Wave Number – must enter a three character number (Example: for Wave 4, enter "004")

Once you've entered the desired criteria, choose "Select Data Points" or "Select Standard Report".

Step 2: Select your data points

This screen allows you to select the data points you want to view in your data file. If you want to select all the data points, simply click the check box next to the "SELECT ALL" option.

Please note that the 471 Application Number and the FRN will always appear in the data file, regardless of what other data points you choose. A complete list of field names and descriptions can be viewed under Field Names and Descriptions.

Scroll to the bottom and click on the "Build Data File" button.

Step 3: Download data file

If your report type is Excel, file will be displayed in a separate window and should be saved to your local computer. If your report type is Tab-Delimited File, the file will appear in a separate window. Depending on your local computer settings, it may open up automatically.

Notes

1. If an FCDL has not been issued for an FRN, the following conditions apply:
   a. Total amount Committed by USAC, Commitment Status, Commitment Status Text and Date of FCDL will be blank in the results
   b. Item 23 results will reflect data featured on the original Form 471. These will appear in the columns prefixed by "ORIG". The columns prefixed by "COMM" will be blank.
2. If an FCDL has been issued for an FRN:
   a. Data will appear for FRNs that have been committed or denied
   b. FRNs with a Pending Status will not appear

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   c. Committed data reflects what is stored in USAC's Commitment Database today (i.e., data reflects any commitments for meritorious appeals, as well as Form 486 and Form 500 adjustments and other funding adjustments, if applicable to that FRN)
   d. Both committed and original data will be shown if a committed FRN is different than the FRN as originally entered into USAC's system
   e. Results prefixed by "ORIG" will be blank if a committed FRN is the same as the original data
   f. Commitment data will appear one day after the date of the FCDL
3. If an Applicant has not yet submitted a Form 486 to USAC, the "FRN service start date as shown on the Form 486" field will be blank.
4. The database used by this tool contains only non-canceled applications that meet the window filing requirements for that funding year.
5. The data request will show by funding request number (FRN) the funding that has been AUTHORIZED FOR DISBURSEMENT to date. It is possible that an authorization for an amount was approved, but no disbursement has yet been made for that amount.
6. If the authorized to disbursed amount is greater than the committed amount for a specific FRN, this indicates that USAC reduced the funding commitment after it had authorized an amount for disbursement. If funds were disbursed in excess of the adjusted commitment for that FRN, USAC seeks recovery of those funds.

Field Names & Descriptions

Required Criteria

Field Name	Description
Funding Year	Funding Year
State	State
BEN	Billed Entity Number assigned by USAC
SPIN	SPIN assigned by USAC

Optional Criteria

471 Application Number	Form 471 Application Number assigned by USAC
FRN	Funding Request Number assigned by USAC to Block 5 of your Form 471
Wave Number	The wave number in which the funding decision was issued
Appeal Wave Number	The appeal wave number in which the funding decision was issued

Identifying Data

471 Application Number	Form 471 Application Number assigned by USAC
471 Form Status	Form Status of 471 (Canceled, Incomplete, Complete, Certified)
470 Application Number	Form 470 Application Number assigned by USAC
470 Form Status	Form Status of 470 (Canceled, Incomplete, Complete, Certified)

Billed Entity Information

Applicant Name	Name of Form 471 Block 1 Billed Entity
Application Type	school, school district, library or consortium
Applicant Street Address1, Applicant Street Address2, Applicant City Applicant State Applicant Zip Code	Applicant address information from the Form 471

Service Provider Information

Service Provider Name	Legal name of the service provider
SPIN	Service Provider Identification Number assigned by USAC

Funding Request Related Dates

FCDL Date	Date of the applicant FCDL
486 SSD	Service Start Date from the Form 486
Funding Year	Funding Year
Contract Exp Date	If a contract exists, this is the date the contract expires
Last Date to Invoice	Last date an Invoice (BEAR or SPI) can be received or postmarked

***NOTE:** The date in this column may not be correct if the date of the related Form 486 Notification Letter is later than the 486 Service Start Date. In that case, the last date for receipt or postmark of an invoice is 120 days after the date of the Form 486 Notification Letter or the date featured below, whichever is later.

Discount Funding Request Data - Recurring Charges

Orig R Monthly Cost	Pre-discount monthly recurring charges from the Form 471
Cmtd R Monthly Cost	Pre-discount monthly recurring charges after review by USAC
Orig R Ineligible Cost	Ineligible pre-discount monthly recurring charges from the Form 471
Cmtd R Ineligible Cost	Ineligible pre-discount monthly recurring charges after review by USAC
Orig R Eligible Cost	Eligible pre-discount monthly recurring charges from the Form 471
Cmtd R Eligible Cost	Eligible pre-discount monthly recurring charges after review by USAC
Orig R Months of Service	Number of months of recurring services from the Form 471
Cmtd R Months of Service	Number of months of recurring services after review by USAC
Orig R Annual Cost	Total annual recurring charges from the Form 471
Cmtd R Annual Cost	Total annual recurring charges after review by USAC

Discount Funding Request Data - Non-Recurring Charges

Orig NR Cost	Pre-discount non-recurring charges from the Form 471
Cmtd NR Cost	Pre-discount non-recurring charges after review by USAC
Orig NR Ineligible Cost	Ineligible pre-discount non-recurring charges from the Form 471
Cmtd NR Ineligible Cost	Ineligible pre-discount monthly recurring charges after review by USAC
Orig NR Eligible Cost	Total annual non-recurring charges from the Form 471
Cmtd NR Eligible Cost	Total annual non-recurring charges after review by USAC

Discount Funding Request Data - Total Charges

Orig Total Cost	Total pre-discount charges from the Form 471
Cmtd Total Cost	Total pre-discount charges after review by USAC
Orig Discount	Discount percentage from the Form 471
Cmtd Discount	Discount percentage after review by USAC
Orig Commitment Request	Total funding request from the Form 471
Cmtd Commitment Request	Total funding request as approved by USAC

Discount Funding Request Data - Other FRN related data items

Orig Category of Service Cmtd Category of Service	Telecommunications Services, Internet Access, Internal Connections, or Basic Maintenance
Orig 471 SSD	Service Start Date from the Form 471
Cmtd 471 SSD	Service Start Date as reviewed by USAC

Funding Decision Data

Commitment Status	FRN commitment status (Funded or Not Funded).
Committed Amount	Total amount committed by USAC
FCDL Comment	Explanation of FCDL decision
Wave Number	Wave number in which the funding decision was issued
Appeal Wave Number	Wave number in which the appeal funding decision was issued
Site Identifier	Entity Number of the recipient of services (blank for shared services)

Invoicing Data

Invoicing Mode	Type of invoice to be processed for FRN (SPI, BEAR, or NOT SET)
Total Authorized Disbursement	Authorized amount for disbursement to date by USAC

APPENDIX C

FCC Form 470

This FCC Form 470 was taken from School "A" FY 2016 and redacted. It is placed here as an example (USAC, 2017j).

USAC
Universal Service Administrative Company

FCC Form 470 – Funding Year 2016

Form 470 Application Number: 111111111
Year16

Billed Entity
School "A" 2016
MAIN STREET
Somewhere, SD 11111-0000
605-111-1111

Billed Entity Number: 11111
FCC Registration Number: 111111111

Contact Information
Some Guy@email.edu
604-111-1111 ext. 0000

Application Type
Applicant Type: School
Recipients of Services: Tribal School

Number of Eligible Entities: 1

Consulting Firms

Name	Consultant Registration Number	Phone Number	Email

Consultants

Name	Phone Number	Email

RFPs

Id	Name

Category One Service Requests

Service Type	Function	Other	Minimum Capacity	Maximum Capacity	Entities	Quantity	Unit	Installation and Initial Configuration?	Maintenance and Technical Support?	Associated RFPs
Internet Access and/or Telecommunications	Voice Service (Analog, Digital, Interconnected VOIP, etc)				1	65	Users	No	No	

Description of Other Functions

Id	Name

Narrative
This is for existing Local and Long Distance Service - no new bids are necessary. This service supports appx 19 primary lines to analog and integrated VoIP Service.

Category Two Service Requests

Service Type	Function	Manufacturer	Other	Entities	Quantity	Unit	Installation and Initial Configuration?	Associated RFPs
Internal Connections	Switches	Hewlett Packard or equivalent			3	Each	Yes	

Service Type	Function	Manufacturer	Other	Entities	Quantity	Unit	Installation and Initial Configuration?	Associated RFPs
Basic Maintenance of Internal Connections	Cabling	No Preference		1	120	Feet		
Basic Maintenance of Internal Connections	Wireless Controller	Other	1	1	1	Each		

Description of Other Manufacturers

Id	Name
1	Ruckus Zone Director 1200

Narrative
2 x 24 Port Gigabit Ethernet Smart Switches, 10/100/1000 Ports, POE and 4 or more fiber Ports. Will be connected to existing cabling and fiber. Integration with main building and outer building necessary. Fiber already exists in all buildings. CAT 6 cabling exists in all buildings. 1 x 48 Port Gigabit Ethernet Smart Switch, 10/100/1000 Ports, POE and 4 or more fiber Ports. Will be connected to existing cabling and fiber. Integration with main building and outer building necessary. Fiber already exists in all buildings. CAT 6 cabling exists in all buildings. Include Manufacturer warranty with new equipment 1 trip per year for Cabling and Fiber runs and accessories Ruckus Zone Director As allowed per E-rate rules

Technical Contact

Some Guy
Coordinator
604-111-1111 ext. 0000
Some Guy@email.edu

State and Local Procurement Restrictions

Recipients of Service

Billed Entity Number	Billed Entity Name
11111	School "A" 2016

Certifications

I certify that the applicant includes:

I certify that the applicant includes schools under the statutory definitions of elementary and secondary schools found in the No Child Left Behind Act of 2001, 20 U.S.C. §§ 7801 (18) and (38), that do not operate as for-profit businesses, and do not have endowments exceeding $50 million.

Other Certifications

I certify that this FCC Form 470 and any applicable RFP will be available for review by potential bidders for at least 28 days before considering all bids received and selecting a service provider. I certify that all bids submitted will be carefully considered and the bid selected will be for the most cost-effective service or equipment offering, with price being the primary factor, and will be the most cost-effective means of meeting educational needs and technology goals.

I certify that I have reviewed all applicable FCC, state, and local procurement/competitive bidding requirements and that I have complied with them. I acknowledge that persons willfully making false statements on this form may be punished by fine or forfeiture, under the Communications Act, 47 U.S.C. §§ 502, 503(b), or fine or imprisonment under Title 18 of the United States Code, 18 U.S.C. § 1001.

I acknowledge that FCC rules provide that persons who have been convicted of criminal violations or held civilly liable for certain acts arising from their participation in the schools and libraries support mechanism are subject to suspension and debarment from the program.

I certify that I will retain required documents for a period of at least 10 years (or whatever retention period is required by the rules in effect at the time of this certification) after the later of the last day of the applicable funding year or the service delivery deadline for the associated funding request. I certify that I will retain all documents necessary to demonstrate compliance with the statute and Commission rules regarding the form for, receipt of, and delivery of services receiving schools and libraries discounts. I acknowledge that I may be audited pursuant to participation in the schools and libraries program. I certify that the services the applicant purchases at discounts provided by 47 U.S.C. § 254 will be used primarily for educational purposes, see 47 C.F.R. § 54.500, and will not be sold, resold or transferred in consideration for money or any other thing of value, except as permitted by the Commission's rules at 47 C.F.R. § 54.513. Additionally, I certify that the entity or entities listed on this form have not received anything of value or a promise of anything of value, other than services and equipment sought by means of this form, from the service provider, or any representative or agent thereof or any consultant in connection with this request for services.

I acknowledge that support under this support mechanism is conditional upon the school(s) and/or library(ies) I represent securing access, separately or through this program, to all of the resources, including computers, training, software, internal connections, maintenance, and electrical capacity necessary to use the services purchased effectively. I recognize that some of the aforementioned resources are not eligible for support. I certify that I have considered what financial resources should be available to cover these costs. I certify that I am authorized to procure eligible services for the eligible entity(ies). I certify that I am authorized to submit this request on behalf of the eligible entity(ies) listed on this form, that I have examined this request, and to the best of my knowledge, information, and belief, all statements of fact contained herein are true.

Authorized Person
Some Guy School "A" 2016

MAIN STREET, PO Box 000
Town, County, SD 11111-0000
604-111-1111 ext. 0000
Some Guy@email.edu

Certified Timestamp
12/22/2015 06:37 AM MST

APPENDIX D

FCC Form 471

This FCC Form 471 was taken from School "A" FY 2016 and redacted. It is placed here as an example (USAC, 2017j).

OMB 3060-0806
FCC Form 471

Approval by OMB
3060-0806

Description of Services Ordered and Certification Form 471

FCC Form 471 — Funding Year 2016

Application Number 111111111

Application Information

Nickname School "A"_2016
Application Number 11111111

Funding Year 2016
Category of Service Category 2

Billed Entity

The Best School
MAIN STREET Somewhere, SD 12345

Contact Information

Some Guy
605-111-111
some.guy@GSEP.EDU

Billed Entity Number: 11111
FCC Registration Number: 1111111111

Holiday/Summer Contact Information

Please cc some.guy@GSEP.EDU after May 15, 2016 through August 15, 2016. Thank you

Consulting Firms

Name	Consultant Registration Number	City	State	Zip Code	Phone Number	Email

School Entities

Name	BEN	Urban or Rural	State LEA ID	State School ID	NCES Code	Number of Students	Students based on estimate	Alternative Discount	CEP Percentage	School Attributes	Endow-ment
THE BEST SCHOO L	11111	Rural		11111		300	N/A	None		Tribal Sch ool; Publi c School; BIE	None

Discount Rate

School Enrollment	School NSLP Count	School NSLP Percentage	School Uraban/ Rural Status	Category One Discount Rate	Category Two Discount Rate	Voice Discount Rate
300	300	100.0%	Rural	90%	85%	50%

Page 1

November 2015

Funding Request for FRN #111111111

Funding Request Nickname: Switching_GWTC
What is the FRN number from the previous year ?

Service Type: Internal Connections

Contract Summary - Contract

Contract Number 51023
Establishing FCC Form 470 11111111
Award Date February 24, 2016
Expiration Date

Account Number
Service Provider Some Service Provider (SPN: 111111111)
Includes Voluntary Extensions? No
Remaining Voluntary Extensions
Total Remaining Contract Length

Document Name	Document Description
Quote - 11111 - Some Great School (003)_Signed.pdf	Switches, install, support for Existing WIFI Controller

Contract Information (Additional)

What is the service start date? July 01, 2016

What is the date your contract expires for the current term of the contract? June 30, 2017

Narrative

This is the Internal Connections portion of the contract including items, labor, perdiem and freight for a total of 9094.00. Does not include the portion for Ruckus SLED WatchDog Support Renewal for ZoneDirector EA 1205, 1 Year @$165.00 and Ruckus SLED WatchDog Support Renewal for ZoneDirector EA ONE License Upgrade, 1 Year @$184.00 Amount for this FRN is for a total of 9094.00: 1 HP 2920-24G-POE+ Switch EA $1,450.00 $1,450.00 1 HP 2920-24G-POE+ Switch EA $1,450.00 $1,450.00 1 HP 2920-48G-POE+ 740W Switch EA $3,022.00 $3,022.00 8 HP X121 1G LC SX Transceiver EA $139.00 $1,112.00 18.00 Install Labor HR $110.00 $1,980.00 1.00 PerDiem EA $40.00 $40.00 Freight: $40.00

Line Item # 1111111111.001

Product and Service Details

Type of Internal Connection Data Distr ibution
Make Hewlett Packard
Is installation included in Price? No

Type of Product Switch
Model HP 2920-24G-POE+ Switch
Is the hardware for this FRN line item leased? No

Cost Calculation for FRN Line Item # 1111111111.001

Monthly Cost	
Monthly Recurring Unit Cost	$0.00
Monthly Recurring Unit Ineligible Costs	- $0.00
Monthly Recurring Unit Eligible Costs	= $0.00
Monthly Quantity	x 0
Units	0
Total Monthly Eligible Recurring Costs	= $0.00
Months of Service	x 12
Total Eligible Recurring Costs	= $0.00

One-Time Cost	
One-time Unit Cost	$1,450.00
One-time Ineligible Unit Costs	- $0.00
One-time Eligible Unit Cost	= $1,450.00
One-time Quantity	x 2
Total Eligible One-time Costs	= $2,900.00

Summary	
Total Eligible Recurring Costs	$0.00
Total Eligible One-time Costs	+ $2,900.00
Pre-Discount Extended Eligible Line Item Cost	= $2,900.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$2,900.00

Line Item # 1111111111.002

Product and Service Details

Type of Internal Connection Data Distr ibution
Type of Product Switch
Make Hewlett Packard
Model HP 2920-48G-POE+ 740W Switch
Is installation included in Price? No
Is the hardware for this FRN line item leased? No

Cost Calculation for FRN Line Item # 1111111111.002

Monthly Cost		One-Time Cost	
Monthly Recurring Unit Cost	$0.00	One-time Unit Cost	$3,022.00
Monthly Recurring Unit Ineligible Costs	- $0.00	One-time Ineligible Unit Costs	- $0.00
		One-time Eligible Unit Cost	= $3,022.00
Monthly Recurring Unit Eligible Costs	= $0.00	One-time Quantity	x 1
Monthly Quantity	x 0	Total Eligible One-time Costs	= $3,022.00
Units	0		
Total Monthly Eligible Recurring Costs	= $0.00	**Summary**	
		Total Eligible Recurring Costs	$0.00
Months of Service	x 12	Total Eligible One-time Costs	+ $3,022.00
Total Eligible Recurring Costs	= $0.00	Pre-Discount Extended Eligible Line Item Cost	= $3,022.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$3,022.00

Line Item # 1111111111.003

Product and Service Details

Type of Internal Connection Cabling/ C onnectors
Type of Product Connectors
Make Hewlett Packard
Model HP X121 1G LC SX Transceiver
Is installation included in Price? No
Is the hardware for this FRN line item leased? No

Cost Calculation for FRN Line Item # 1111111111.003

Monthly Cost		One-Time Cost	
Monthly Recurring Unit Cost	$0.00	One-time Unit Cost	$139.00
Monthly Recurring Unit Ineligible Costs	- $0.00	One-time Ineligible Unit Costs	- $0.00
		One-time Eligible Unit Cost	= $139.00
Monthly Recurring Unit Eligible Costs	= $0.00	One-time Quantity	x 8
Monthly Quantity	x 0	Total Eligible One-time Costs	= $1,112.00
Units	0		
Total Monthly Eligible Recurring Costs	= $0.00	**Summary**	
		Total Eligible Recurring Costs	$0.00

Months of Service	x 12	Total Eligible One-time Costs	+ $1,112.00
Total Eligible Recurring Costs	= $0.00	Pre-Discount Extended Eligible Line Item Cost	= $1,112.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$1,112.00

Line Item # 1111111111.004

Product and Service Details

Type of Internal Connection Miscellane ous

Type of Product Installation, Activation, & Initial Configuration

Make Hewlett Packard

Model All Products on Contract - This is for Install, Perdiem and Freight

Is installation included in Price? No

Is the hardware for this FRN line item leased? No

Cost Calculation for FRN Line Item # 1111111111.004

Monthly Cost		One-Time Cost	
Monthly Recurring Unit Cost	$0.00	One-time Unit Cost	$110.00
Monthly Recurring Unit Ineligible Costs	- $0.00	One-time Ineligible Unit Costs	- $0.00
Monthly Recurring Unit Eligible Costs	= $0.00	One-time Eligible Unit Cost	= $110.00
Monthly Quantity	x 0	One-time Quantity	x 18
Units	0	Total Eligible One-time Costs	= $1,980.00
Total Monthly Eligible Recurring Costs	= $0.00	**Summary**	
Months of Service	x 12	Total Eligible Recurring Costs	$0.00
Total Eligible Recurring Costs	= $0.00	Total Eligible One-time Costs	+ $1,980.00
		Pre-Discount Extended Eligible Line Item Cost	= $1,980.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$1,980.00

Line Item # 1111111111.005

Product and Service Details

Type of Internal Connection Miscellane ous

Type of Product Fees, Taxes, etc.

Make Hewlett Packard

Model Freight for all products

Is installation included in Price? No

Is the hardware for this FRN line item leased? No

Cost Calculation for FRN Line Item # 1111111111.005

Monthly Cost		One-Time Cost	
Monthly Recurring Unit Cost	$0.00	One-time Unit Cost	$40.00

Monthly Recurring Unit Ineligible Costs	- $0.00	One-time Ineligible Unit Costs	- $0.00
Monthly Recurring Unit Eligible Costs	= $0.00	One-time Eligible Unit Cost	= $40.00
Monthly Quantity	x 0	One-time Quantity	x 1
Units	0	Total Eligible One-time Costs	= $40.00
Total Monthly Eligible Recurring Costs	= $0.00	**Summary**	
Months of Service	x 12	Total Eligible Recurring Costs	$0.00
Total Eligible Recurring Costs	= $0.00	Total Eligible One-time Costs	+ $40.00
		Pre-Discount Extended Eligible Line Item Cost	= $40.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$40.00

FRN Calculation for FRN #111111111 -Switching_GWTC

Monthly Charges		**Total Requested Amount**	
Total Monthly Recurring Charges	$0.00	Total Eligible Pre-Discount Recurring Charges	$0.00
Total Monthly Ineligible Charges	- $0.00	Total Eligible Pre-Discount One-Time Charges	+ $9,054.00
Total Monthly Eligible Charges	= $0.00	Total Pre-Discount Charges	= $9,054.00
Total Number of Months of Service	x 12	Discount Rate	85%
Total Eligible Pre-Discount Recurring Charges	= $0.00	Funding Commitment Request	= $7,695.90
One-Time Charges			
Total One-Time Charges	$9,054.00		
Total Ineligible One-Time Charges	- $0.00		
Total Eligible Pre-Discount One-Time Charges	= $9,054.00		

Funding Request for FRN #111111111

Funding Request Nickname: BMIC_GWTC
What is the FRN number from the previous year ?
Service Type: Basic Maintenance of Internal Connections

Contract Summary - Contract

Contract Number 51023
Establishing FCC Form 470 111111111
Award Date February 24, 2016
Expiration Date
Account Number
Service Provider Some Service Provider (SPN: 111111111)
Includes Voluntary Extensions? No
Remaining Voluntary Extensions
Total Remaining Contract Length

Document Name	Document Description
Quote - 51023 - Some Great School (003)_Signed.pdf	Switches, install, support for Existing WIFI Controller

Contract Information (Additional)

What is the service start date? July 01, 2016
What is the date your contract expires for the current term of the contract? June 30, 2017

Narrative

This is for Warranty Service for existing Ruckus WIFI Controller: Ruckus SLED WatchDog Support Renewal for ZoneDirector EA 1205, 1 Year@ $165.00 Ruckus SLED WatchDog Support Renewal for ZoneDirector EA ONE License Upgrade, 1 Year@ $184.00

Line Item # 111111111.001

Product and Service Details

Type of Product Being Maintained Basic Maintenance of Internal Connection s

Cost Calculation for FRN Line Item # 1111111111.001

Monthly Cost		One-Time Cost	
Monthly Recurring Cost	$0.00	One-time Cost	$165.00
Monthly Recurring Ineligible Costs	- $0.00	One-time Ineligible Costs	- $0.00
Monthly Recurring Eligible Costs	= $0.00	One-time Eligible Cost	= $165.00
Months of Service	x 12		
Total Eligible Recurring Costs	= $0.00	**Summary**	
		Total Eligible Recurring Costs	$0.00
		One-time Eligible Costs	+ $165.00
		Pre-Discount Extended Eligible Line Item Cost	= $165.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$165.00

Line Item # 1111111111.002

Product and Service Details

Type of Product Being Maintained	Basic Maintenance of Internal Connection s

Cost Calculation for FRN Line Item # 1111111111.002

Monthly Cost	
Monthly Recurring Cost	$0.00
Monthly Recurring Ineligible Costs	- $0.00
Monthly Recurring Eligible Costs	= $0.00
Months of Service	x 12
Total Eligible Recurring Costs	= $0.00

One-Time Cost	
One-time Cost	$184.00
One-time Ineligible Costs	- $0.00
One-time Eligible Cost	= $184.00

Summary	
Total Eligible Recurring Costs	$0.00
One-time Eligible Costs	+ $184.00
Pre-Discount Extended Eligible Line Item Cost	= $184.00

Recipients of Services

Ben	Name	Amount
11111	Some Great School	$184.00

FRN Calculation for FRN #111111111 -BMIC_GWTC

Monthly Charges	
Total Monthly Recurring Charges	$0.00
Total Monthly Ineligible Charges	- $0.00
Total Monthly Eligible Charges	= $0.00
Total Number of Months of Service	x 12
Total Eligible Pre-Discount Recurring Charges	= $0.00
One-Time Charges	
Total One-Time Charges	$349.00
Total Ineligible One-Time Charges	- $0.00
Total Eligible Pre-Discount One-Time Charges	= $349.00

Total Requested Amount	
Total Eligible Pre-Discount Recurring Charges	$0.00
Total Eligible Pre-Discount One-Time Charges	+ $349.00
Total Pre-Discount Charges	= $349.00
Discount Rate	85%
Funding Commitment Request	= $296.65

Connectivity Questions

Per Entity Basis Questions

Enity Name	Some Great School	**Entity Number**	11111

What is the total bandwidth speed from this location (including non E-rate supported services)?

Download Speed	20.00	**Download Speed Units**	Mbps
Upload Speed	20.00	**Upload Speed Units**	Mbps
What is the predominant connection type coming to this location?	Copper	**How sufficient is the quality of the Wi-Fi at this location?**	Mostly
What are your biggest barriers to having a robust internal	Outdated equipment	**If Other, please specify**	

network in your classrooms at this location?

Certifications

I certify that the entities listed in this application are eligible for support because they are schools under the statutory definitions of elementary and secondary schools found in the No Child Left Behind Act of 2001, 20 U.S.C. §§ 7801(18) and (38), that do not operate as for-profit businesses and do not have endowments exceeding $50 million.

I certify that the entity I represent or the entities listed on this application have secured access, separately or through this program, to all of the resources, including computers, training, software, internal connections, maintenance, and electrical capacity, necessary to use the services purchased effectively. I recognize that some of the aforementioned resources are not eligible for support. I certify that the entities I represent or the entities listed on this application have secured access to all of the resources to pay the discounted charges for eligible services from funds to which access has been secured in the current funding year. I certify that the Billed Entity will pay the non-discount portion of the cost of the goods and services to the service provider(s).

Total Funding Summary

Below is a summary of the total line item costs on this FCC Form 471:

Summary	
Total funding year pre-discount eligible amount on this FCC Form 471	$9,403.00
Total funding commitment request amount on this FCC Form 471	$7,992.55
Total applicant non-discount share of the eligible amount	$1,410.45
Total budgeted amount allocated to resources not eligible for E-rate support	$0.00
Total amount necessary for the applicant to pay the non-discount share of eligible and any ineligible amounts	$1,410.45
Are you receiving any of the funds directly from a service provider listed on any of the FCC Forms 471 filed by this Billed Entity for this funding year?	No
Has a service provider listed on any of the FCC Forms 471 filed by this Billed Entity for this funding year assited you in locating funds needed to pay your non-discounted share?	No

I certify an FCC Form 470 was posted and that any related RFP was made available for at least 28 days before considering all bids received and selecting a service provider. I certify that all bids submitted were carefully considered and the most cost-effective service offering was selected, with price being the primary factor considered, and is the most cost-effective means of meeting educational needs and technology goals.

I certify that the entity responsible for selecting the service provider(s) has reviewed all applicable FCC, state, and local procurement/competitive bidding requirements and that the entity or entities listed on this application have complied with them.

I certify that the services the applicant purchases at discounts provided by 47 U.S.C. § 254 will be used primarily for educational purposes, see 47 C.F.R. § 54.500 and will not be sold, resold or transferred in consideration for money or any other thing of value, except as permitted by the Commission's rules at 47 C.F.R. § 54.513. Additionally, I certify that the entity or entities listed on this application have not received anything of value or a promise of anything of value, as prohibited by the Commission's rules at 47 C.F.R. § 54.503(d), other than services and equipment sought by means of this form, from the service provider, or any representative or agent thereof or any consultant in connection with this request for services.

I certify that I and the entity(ies) I represent have complied with all program rules and I acknowledge that failure to do so may result in denial of discount funding and/or cancellation of funding commitments. There are signed contracts or other legally binding agreements covering all of the services listed on this FCC Form 471 except for those services provided under non-contracted tariffed or month-to-month arrangements. I acknowledge that failure to comply with program rules could result in civil or criminal prosecution by the appropriate law enforcement authorities.

I acknowledge that the discount level used for shared services is conditional, for future years, upon ensuring that the most disadvantaged schools and libraries that are treated as sharing in the service, receive an appropriate share of benefits from those services.

I certify that I will retain required documents for a period of at least 10 years (or whatever retention period is required by the rules in effect at the time of this certification) after the later of the last day of the applicable funding year or the service delivery deadline for the associated funding request. I acknowledge that I may be audited pursuant to participation in the schools and libraries program. I certify that I will retain all documents necessary to demonstrate compliance with the statute and Commission rules regarding the application for, receipt of, and delivery of services receiving schools and libraries discounts, and that if audited, I will make such records available to USAC.

I certify that I am authorized to order telecommunications and other supported services for the eligible entity(ies) listed on this application. I certify that I am authorized to submit this request on behalf of the eligible entity(ies) listed on this application, that I have examined this request, that all of the information on this form is true and correct to the best of my knowledge, that the entities that are receiving discounts pursuant to this application have complied with the terms, conditions and purposes of the program, that no kickbacks were paid to anyone and that false statements on this form can be punished by fine or forfeiture under the Communications Act, 47 U.S.C. §§ 502, 503(b), or fine or imprisonment under Title 18 of the United States Code, 18 U.S.C. § 1001 and civil violations of the False Claims Act.

I acknowledge that FCC rules provide that persons who have been convicted of criminal violations or held civilly liable for certain acts arising from their participation in the schools and libraries support mechanism are subject to suspension and debarment from the program. I will institute reasonable measures to be informed, and will notify USAC should I be informed or become aware that I or any of the entities listed on this application, or any person associated in any way with my entity and/or the entities listed on this application, is convicted of a criminal violation or held civilly liable for acts arising from their participation in the schools and libraries support mechanism.

I certify that if any of the Funding Requests on this FCC Form 471 are for discounts for products or services that contain both eligible and ineligible components, that I have allocated the eligible and ineligible components as required by the Commission's rules at 47 C.F.R. § 54.504.

NOTICE

Section 54.504 of the Federal Communications Commission's rules requires all schools and libraries ordering services that are eligible for and seeking universal service discounts to submit an application for such discounts by filing this Services Ordered and Certification Form (FCC Form 471) with the Universal Service Administrator. 47 C.F.R. § 54.504. The collection of information stems from the Commission's authority under Section 254 of the Communications Act of 1934, as amended. 47 U.S.C. § 254. The data in the report will be used to ensure that schools and libraries comply with the application requirements for universal service discounts contained in 47 C.F.R. § 54.504. Schools and libraries must file this form themselves or as part of a consortium. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The FCC is authorized under the Communications Act of 1934, as amended, to collect the information we request in this form. We will use the information you provide to determine whether approving your application for universal service discounts is in the public interest. If we believe there may be a violation or a potential violation of any applicable statute, regulation, rule or order, your application may be referred to the Federal, state, or local agency responsible for investigating, prosecuting, enforcing, or implementing the statute, rule, regulation or order. In certain cases, the information in your application for universal service discounts may be disclosed to the Department of Justice or a court or adjudicative body when (a) the FCC; or (b) any employee of the FCC; or (c) the United States Government is a party of a proceeding before the body or has an interest in the proceeding. In addition, consistent with the Communications Act of 1934, FCC regulations and orders, the Freedom of Information Act, 5 U.S.C. § 552, or other applicable law, information provided in or submitted with this form or in response to subsequent inquiries may be disclosed to the public. If you owe a past due debt to the Federal government, the information you provide may also be disclosed to the Department of the Treasury Financial Management Service, other Federal agencies and/or your employer to offset your salary, IRS tax refund or other payments to collect that debt. The FCC may also provide the information to these agencies through the matching of computer records when authorized. If you do not provide the information we request on the form, the FCC or the Universal Service Administrator may delay processing of your application for universal service discounts or may return your application without action. The foregoing Notice is required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13, 44 U.S.C. § 3501, et seq. Public reporting burden for this collection of information is estimated to average 4.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing, and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the reporting burden to the Federal Communications Commission, Performance Evaluation and Records Management, Washington, DC 20554. We also will accept your comments via the email if you send them to PRA@FCC.gov. DO NOT SEND COMPLETED WORKSHEETS TO THESE ADDRESSES.

Authorized Person

Name:	Some Guys
Title:	Coordinator
Employer:	Some Guy
Address:	MAIN STREET Some Where SD 11111
Phone:	604-455-1209
Email:	Some.Guy@GSEP.edu

Certified Timestamp

01-Mar-2016 14:02:41 EST

APPENDIX E

School "A" Funding Data

Each FY they applied for E-rate subsidies as applicant (USAC, 2018c, 2019a).

Funding Year	FCDL Date	Commitment Status	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave	Remarks
2004	4/27/2004	FUNDED	TELCOMM SERVICES	$37,584.00	$18,279.79	$18,279.79	1	
2008	8/5/2008	FUNDED	TELCOMM SERVICES	$8,512.56	$1,152.79	$1,152.79	17	
2008	8/5/2008	FUNDED	TELCOMM SERVICES	$9,173.30	$9,173.30	$8,225.20	17	
2008	8/5/2008	FUNDED	INTERNAL CONNECTIONS MNT	$10,969.24	$10,969.24	$10,969.20	17	
2008	8/5/2008	NOT FUNDED	INTERNET ACCESS	$144.07	$0.00		17	
2008	8/5/2008	FUNDED	INTERNAL CONNECTIONS	$318,659.40	$318,659.40	$187,974.90	17	
2008	8/5/2008	NOT FUNDED	INTERNET ACCESS	$900.07	$0.00		17	
2009	11/3/2009	FUNDED	TELCOMM SERVICES	$3,630.42	$3,564.65	$3,564.65	26	Late Wave
2009	11/3/2009	FUNDED	TELCOMM SERVICES	$10,661.22	$8,828.57	$8,490.39	26	Late Wave
2009	11/3/2009	FUNDED	INTERNAL CONNECTIONS MNT	$15,782.36	$15,782.36	$15,782.36	26	Late Wave
2009	11/3/2009	FUNDED	INTERNET ACCESS	$6,930.00	$6,930.00		26	Late Wave
2009	11/3/2009	FUNDED	INTERNAL CONNECTIONS	$13,529.70	$13,529.70	$13,529.70	26	Late Wave
2009	11/3/2009	FUNDED	TELCOMM SERVICES	$12,287.95	$12,287.95		26	Cellular Reimbursement
2010	6/1/2011	NOT FUNDED	INTERNAL CONNECTIONS MNT	$11,923.20	$0.00		51	Late Wave
2010	6/1/2011	FUNDED	TELCOMM SERVICES	$3,606.23	$1,529.82		51	Late Wave
2010	6/1/2011	FUNDED	TELCOMM SERVICES	$5,734.58	$2,375.24	$2,375.24	51	Late Wave
2011	1/4/2012	FUNDED	TELCOMM SERVICES	$1,529.17	$1,529.17		28	Cellular Reimbursement
2011	3/13/2012	FUNDED	INTERNAL CONNECTIONS MNT	$7,020.86	$4,012.20		38	Late Wave
2011	1/4/2012	FUNDED	TELCOMM SERVICES	$9,248.90	$9,248.90	$9,248.90	28	Late Wave
2012	12/18/2012	NOT FUNDED	INTERNAL CONNECTIONS MNT	$11,122.06	$0.00		22	PIA - Did not Verify Services
2012	7/10/2012	FUNDED	INTERNET ACCESS	$3,600.50	$3,600.50		1	
2012	7/10/2012	FUNDED	TELCOMM SERVICES	$1,066.61	$1,066.61		1	Cellular Reimbursement
2012	7/10/2012	FUNDED	TELCOMM SERVICES	$4,351.00	$4,351.00	$4,351.00	1	
2013	3/5/2014	NOT FUNDED	INTERNAL CONNECTIONS MNT	$10,218.53	$0.00		41	FCC - No Cat 2 Funds
2013	3/5/2014	NOT FUNDED	INTERNAL CONNECTIONS	$30,001.88	$0.00		41	FCC - No Cat 2 Funds
2013	11/6/2013	NOT FUNDED	INTERNET ACCESS	$18,607.50	$0.00		25	Late Wave
2013	11/6/2013	FUNDED	TELCOMM SERVICES	$1,118.66	$1,118.66		25	Cellular Reimbursement
2013	11/6/2013	FUNDED	TELCOMM SERVICES	$9,099.32	$9,099.32	$9,099.32	25	Late Wave
2013	11/6/2013	FUNDED	INTERNET ACCESS	$2,255.80	$2,255.80		25	Late Wave
2014	8/27/2014	NOT FUNDED	INTERNAL CONNECTIONS MNT	$6,783.26	$0.00		16	FCC - No Cat 2 Funds
2014	7/16/2014	FUNDED	TELCOMM SERVICES	$10,422.54	$10,422.54	$10,318.58	10	
2014	7/16/2014	FUNDED	TELCOMM SERVICES	$3,078.97	$3,078.97		10	Cellular Reimbursement
2015	8/7/2015	FUNDED	INTERNAL CONNECTIONS MNT	$7,170.83	$7,170.83	$7,170.83	11	
2015	8/7/2015	FUNDED	INTERNAL CONNECTIONS MNT	$296.62	$296.62	$296.62	11	
2015	7/6/2015	FUNDED	VOICE SERVICES	$5,763.00	$5,763.00	$5,763.00	7	
2015	8/7/2015	FUNDED	INTERNAL CONNECTIONS	$10,611.14	$10,314.49	$10,314.49	11	
2016	7/29/2016	FUNDED	Internal Connections	$7,695.90	$7,695.90	$7,695.90	6	
2016	7/29/2016	FUNDED	Basic Maintenance of Internal Connections	$296.65	$296.65	$296.65	6	
2016	7/29/2016	FUNDED	Voice	$5,102.34	$5,101.50	$5,098.79	6	
2017	7/14/2017	FUNDED	Basic Maintenance of Internal Connections	$296.65	$296.65	$296.65	7	
				$636,786.99	$509,782.12	$340,294.95		

FRNs	40	Total Funding	
		Orig Commitment Request	Committed Amount
Funded	34		
Not Funded	6	$636,786.99	$509,782.12

Total Disbursements by FRN Type	
Cmtd FRN Service Type	Total Authorized Disbursement
TELCOMM SERVICES	$85,967.65
INTERNET ACCESS	
Basic Maintenance of Internal Connections	$34,812.31
INTERNAL CONNECTIONS	$219,514.99
Totals	$340,294.95

APPENDIX F

School "B" Funding Data

Each FY they applied for E-rate subsidies as applicant (USAC, 2018c, 2019a).

Funding Year	FCDL Date	Commitment Status	Cmtd FRN Service Type	Orig Commitment Request	Committed Amount	Total Authorized Disbursement	Wave	Remarks
2004			INTERNAL CONNECTIONS					471 Not Filed
2004			TELCOMM SERVICES					471 Not Filed
2005	6/27/2005	NOT FUNDED	INTERNAL CONNECTIONS MNT	$4,716.00	$0.00		1	PIA - Did not Verify Services
2005	6/27/2005	NOT FUNDED	TELCOMM SERVICES	$15,676.63	$0.00		1	PIA - Did not Verify Services
2006	12/24/2008	FUNDED	TELCOMM SERVICES	$54,404.76	$25,559.60		60R	FRN was appealed - likely denied
2007	5/21/2007	FUNDED	TELCOMM SERVICES	$8,311.36	$8,311.36	$8,311.36	1	
2007	5/21/2007	FUNDED	TELCOMM SERVICES	$14,509.91	$14,509.91	$14,509.91	1	
2008	7/16/2008	FUNDED	TELCOMM SERVICES	$36,255.60	$18,686.70	$17,571.00	13	
2008	7/16/2008	FUNDED	TELCOMM SERVICES	$5,767.20	$5,767.20	$4,212.00	13	
2008	7/16/2008	FUNDED	INTERNAL CONNECTIONS	$17,620.14	$12,348.40	$12,348.40	13	
2008	7/16/2008	NOT FUNDED	INTERNAL CONNECTIONS	$19,742.73	$19,637.49		13	
2009	6/9/2009	FUNDED	TELCOMM SERVICES	$4,332.10	$3,606.98	$3,606.98	7	
2009	9/3/2009	FUNDED	INTERNAL CONNECTIONS MNT	$11,676.64	$11,676.64	$11,676.64	19	
2009	9/3/2009	FUNDED	INTERNAL CONNECTIONS	$207,018.94	$207,018.94	$183,051.00	19	
2009	6/9/2009	FUNDED	TELCOMM SERVICES	$15,833.02	$15,574.36	$15,574.36	7	
2010			TELCOMM SERVICES					471 Not Filed
2011	6/12/2012	FUNDED	TELCOMM SERVICES	$28,544.94	$17,007.30	$17,007.30	48	Late Wave
2011	6/12/2012	FUNDED	INTERNAL CONNECTIONS MNT	$9,900.90	$9,900.90		48	Late Wave
2011	6/12/2012	FUNDED	TELCOMM SERVICES	$15,014.38	$12,287.05	$12,287.05	48	Late Wave
2012	8/13/2012	FUNDED	TELCOMM SERVICES	$6,321.56	$6,321.56	$6,321.56	6	
2012	8/13/2012	FUNDED	TELCOMM SERVICES	$16,140.82	$16,140.82	$16,140.82	6	
2013	7/24/2014	NOT FUNDED	INTERNAL CONNECTIONS	$40,007.70	$0.00		59	FCC - No Cat 2 Funds
2013	7/24/2014	NOT FUNDED	INTERNAL CONNECTIONS	$174,220.93	$0.00		59	FCC - No Cat 2 Funds
2013	10/14/2015	FUNDED	TELCOMM SERVICES	$17,214.66	$12,287.59	$11,321.36	101	Late Wave
2013	7/24/2014	NOT FUNDED	TELCOMM SERVICES	$14,520.95	$0.00		59	FRN Changed to IC, FCC - No Cat 2 Funds
2013	10/14/2015	NOT FUNDED	INTERNET ACCESS	$51,300.00	$0.00		101	Contract Signed Before ACD
2013	7/24/2014	NOT FUNDED	INTERNAL CONNECTIONS MNT	$17,550.00	$0.00		59	FCC - No Cat 2 Funds
2013	7/24/2014	NOT FUNDED	INTERNAL CONNECTIONS	$115,970.57	$0.00		59	FCC - No Cat 2 Funds
2013	10/14/2015	FUNDED	TELCOMM SERVICES	$17,933.51	$17,933.51	$16,577.48	101	Late Wave
2014	6/11/2014	FUNDED	INTERNET ACCESS	$1,435.43	$1,435.43	$1,435.39	5	
2014	8/27/2014	NOT FUNDED	INTERNAL CONNECTIONS	$37,512.90	$0.00		16	FCC - No Cat 2 Funds
2014	8/27/2014	NOT FUNDED	INTERNAL CONNECTIONS	$103,218.06	$0.00		16	FCC - No Cat 2 Funds
2014	8/27/2014	NOT FUNDED	INTERNAL CONNECTIONS	$167,923.21	$0.00		16	FCC - No Cat 2 Funds
2014	8/27/2014	NOT FUNDED	INTERNAL CONNECTIONS MNT	$17,550.00	$0.00		16	FCC - No Cat 2 Funds
2014	6/11/2014	FUNDED	INTERNET ACCESS	$10,076.40	$10,076.40	$8,571.60	5	
2014	6/11/2014	FUNDED	TELCOMM SERVICES	$12,751.67	$12,751.67	$11,422.04	5	
2014	8/27/2014	FUNDED	TELCOMM SERVICES	$16,773.70	$16,773.70	$16,535.03	5	
2015	9/4/2015	Funded	VOICE SERVICES	$8,952.97	$8,952.97	$8,952.97	15	
2015	7/24/2015	Funded	INTERNAL CONNECTIONS MIBS	$1,632.00	$1,632.00	$1,632.00	9	
2015	9/4/2015	Funded	INTERNET ACCESS	$10,076.40	$10,076.40	$10,076.40	15	
2015	9/4/2015	Funded	INTERNET ACCESS	$1,402.92	$1,402.92	$1,402.92	15	
2015	9/4/2015	Funded	VOICE SERVICES	$14,053.20	$14,053.20	$13,271.90	15	
2016	7/29/2016	Funded	Voice	$9,247.26	$9,247.50	$9,247.50	6	
2016	8/6/2016	Funded	Voice - Cellular	$4,356.42	$4,356.48		6	Cellular Reimbursement
2016	7/29/2016	Funded	Data Transmission and/or Internet Access	$10,076.40	$10,076.40	$10,076.40	6	
2016	7/29/2016	Funded	Internal Connections	$15,231.16	$15,231.16	$14,147.05	7	
2017	9/22/2017	Funded	Voice	$5,548.50	$5,548.50	$5,548.50	17	
2017	9/22/2017	Funded	Voice - Cellular	$2,613.89	$2,613.89		17	Cellular Reimbursement
				$1,390,938.44	$558,804.93	$462,836.92		

FRNs	45
Funded	32
Not Funded	13

Total Funding

Orig Commitment Request	Committed Amount
$1,390,951.44	$558,804.93

Total Disbursements by FRN Type

Cmtd FRN Service Type	Total Authorized Disbursement
TELCOMM SERVICES	$208,419.12
INTERNET ACCESS	$31,562.71
Basic Maintenance of	$11,676.64
INTERNAL CONNECTIONS	$211,178.45
Totals	$462,836.92

APPENDIX G

2018 Eligibility Services List

Retrieved from the USAC, Schools and Libraries Website (USAC, 2017p).

APPENDIX B

Eligible Services List for Funding Year 2018
Schools and Libraries Universal Service Support Mechanism

(WC Docket No. 13-184)

The Federal Communications Commission's (FCC's) rules provide that all services that are eligible to receive discounts under the Schools and Libraries Universal Service Support Mechanism (otherwise known as the E-rate program or E-rate) are listed in this Eligible Services List (ESL). The E-rate program is administered by the Universal Service Administrative Company (USAC). Eligible schools and libraries may seek E-rate support for eligible Category One telecommunications services, telecommunications, and Internet access, and Category Two internal connections, basic maintenance, and managed internal broadband services as identified herein. 47 CFR §§ 54.5, 54.500, and 54.502(a).

Additional guidance from USAC about the E-rate application process and about eligible services, including a glossary of terms, is available at USAC's website at http://www.usac.org/sl/. The documents on USAC's website are not incorporated by reference into the ESL and do not bind the Commission. Thus, they will not be used to determine whether a service or product is eligible. Applicants and service providers are free to refer to those documents, but just for informal guidance. This ESL applies to funding requests for Funding Year 2018.

Category One

The first category of supported services, Category One, includes the services needed to support broadband connectivity to schools and libraries. Eligible Category One services are listed in the entries for data transmission services and Internet access and voice services. This category consists of the services that provide broadband to eligible locations including data links that connect multiple points, services used to connect eligible locations to the Internet, and services that provide basic conduit access to the Internet. With the exception of leased dark fiber and self-provisioned broadband networks, maintenance and technical support appropriate to maintain reliable operation are only eligible for support when provided as a component of these services.

Data Transmission Services and Internet Access

Digital transmission services and Internet access are eligible in Category One. These services include:

- Asynchronous Transfer Mode (ATM)
- Broadband over Power Lines
- Cable Modem
- Digital Subscriber Line (DSL)
- DS-1 (T-1), DS-3 (T-3), and Fractional T-1 or T-3
- Ethernet
- Integrated Services Digital Network (ISDN)
- Leased Lit Fiber
- Leased Dark Fiber (including dark fiber indefeasible rights of use (IRUs) for a set term)
- Self-Provisioned Broadband Networks
- Frame Relay
- Multi-Protocol Label Switching (MPLS)
- OC-1, OC-3, OC-12, OC-n
- Satellite Service
- Switched Multimegabit Data Service

- Telephone dial-up
- Wireless services (e.g., microwave)

Notes: (1) E-rate support is available for leased lit fiber, leased dark fiber, and self-provisioned broadband networks as described in the *2014 Second E-rate Order* (FCC 14-189). Eligible costs include monthly charges, special construction, installation and activation charges, modulating electronics and other equipment necessary to make a Category One broadband service functional ("Network Equipment"), and maintenance and operation charges. Network Equipment and maintenance and operation costs for existing networks are eligible. All equipment and services, including maintenance and operation, must be competitively bid.

(2) Applicants that seek bids for leased dark fiber must also seek bids for leased lit fiber service and fully consider all responsive bids. Similarly, applicants that seek bids for self-provisioned broadband networks must also seek bids for the needed connectivity via services provided over third-party networks, and fully consider all responsive bids.

(3) Applicants may seek special construction funding for the upfront, non-recurring costs for the deployment of new or upgraded facilities. The eligible components of special construction are construction of network facilities, design and engineering, and project management.

(4) Staff salaries and labor costs for personnel of the applicant or underlying beneficiary are not E-rate eligible.

Eligible Voice Services

Eligible voice services are subject to an annual 20 percentage point phase down of E-rate support that began in FY 2015, as described in the *2014 E-rate Order*. For FY 2018, the effective discount rate will be 80 percentage points less than other Category One services. The reduced discount rate for voice services will apply to all applicants and all costs for the provision of telephone services and circuit capacity dedicated to providing voice services including:

- Centrex
- Integrated Services Digital Network (ISDN)
- Interconnected voice over Internet protocol (VoIP)
- Local, long distance, and 800 (toll-free) service
- Plain old telephone service (POTS)
- Radio loop
- Satellite telephone service
- Shared telephone service (only the portion of the shared services relating to the eligible use and location may receive discounts)
- Wireless telephone service, including cellular voice and excluding data and text messaging

Category Two

The second category of equipment and services eligible for E-rate support, Category Two, includes the internal connections needed for broadband connectivity within schools and libraries. Support is limited to the internal connections necessary to bring broadband into, and provide it throughout, schools and libraries. These are broadband connections used for educational purposes within, between, or among instructional buildings that comprise a school campus (as defined below) or library branch, and basic maintenance of these connections, as well as services that manage and operate owned or leased broadband internal connections (e.g., managed internal broadband services or managed Wi-Fi). Category Two support is subject to per-school or per-library budgets as set forth in 47 CFR § 54.502. The eligible components and services in Category Two are:

Eligible Broadband Internal Connections

- Access points used in a local area network (LAN) or wireless local area network (WLAN) environment (such as wireless access points)
- Antennas, cabling, connectors, and related components used for internal broadband connections
- Caching
- Firewall services and components separate from basic firewall protection provided as a standard component of a vendor's Internet access service.
- Switches
- Routers
- Racks
- Uninterruptible Power Supply (UPS)/Battery Backup
- Wireless controller systems
- Software supporting the components on this list used to distribute high-speed broadband throughout school buildings and libraries

Notes: (1) Functionalities listed above that can be virtualized in the cloud, and equipment that combines eligible functionalities, like routing and switching, are also eligible.

(2) A manufacturer's multi-year warranty for a period up to three years that is provided as an integral part of an eligible component, without a separately identifiable cost, may be included in the cost of the component.

(3) Caching is defined as a method that stores recently accessed information. Caching stores information locally so that the information is accessible more quickly than if transmitted across a network from a distance. A caching service or equipment that provides caching, including servers necessary for the provision of caching, is eligible for funding.

Eligible Managed Internal Broadband Services

- Services provided by a third party for the operation, management, and monitoring of eligible broadband internal connections are eligible managed internal broadband services (e.g., managed Wi-Fi).
- E-rate support is limited to eligible expenses or portions of expenses that directly support and are necessary for the broadband connectivity within schools and libraries. Eligible expenses include the management and operation of the LAN/WLAN, including installation, activation and initial configuration of eligible components, and on-site training on the use of eligible equipment.
- In some eligible managed services models, the third-party manager owns and installs the equipment and school and library applicants lease the equipment as part of the managed services contract. In other cases, the school or library may own the equipment, but have a third party manage it for them.

Basic Maintenance of Eligible Broadband Internal Connections

E-rate support is available for basic maintenance and technical support appropriate to maintain reliable operation when provided for eligible broadband internal connections.

The following basic maintenance services are eligible:

- Repair and upkeep of eligible hardware
- Wire and cable maintenance
- Configuration changes
- Basic technical support including online and telephone based technical support
- Software upgrades and patches including bug fixes and security patches

Eligibility Limitations for Category Two:

Eligibility limitations for managed internal broadband services – The equipment eligible for support as part of a managed internal broadband service may only include equipment listed as a broadband internal connections component above. Upfront charges that are part of a managed service contract are eligible for E-rate support except to the extent that the upfront charges are for any ineligible internal connections (e.g., servers other than those that are necessary to provide caching) which, if included in the contract, must be cost allocated out of any funding request.

Eligibility limitations for basic maintenance – Basic maintenance is eligible for support only if it is a component of a maintenance agreement or contract for eligible broadband internal connections. The agreement or contract must specifically identify the eligible internal connections covered, including product name, model number, and location. Support for basic maintenance will be paid for the actual work performed under the agreement or contract. Support for bug fixes, security patches, and technical support is not subject to this limitation. Basic maintenance does not include:

- Services that maintain ineligible equipment
- Upfront estimates that cover the full cost of every piece of eligible equipment
- Services that enhance the utility of equipment beyond the transport of information, or diagnostic services in excess of those necessary to maintain the equipment's ability to transport information
- Network management services, including 24-hour network monitoring
- On-site technical support (i.e., contractor duty station at the applicant site) unless applicants present sufficient evidence of cost-effectiveness
- Unbundled warranties

Eligibility Explanations for Certain Category One and Category Two Services:

Internet access – Eligible Internet access may include features such as basic firewall protection, domain name service, and dynamic host configuration when these features are provided as a standard component of a vendor's Internet access service. Firewall protection that is provided by a vendor other than the Internet access provider or priced out separately will be considered a Category Two internal connections component. Examples of items that are ineligible components of Internet access include applications, content, e-mail, and end-user devices and equipment such as computers, laptops, and tablets.

Wireless services and wireless Internet access – As clarified in the *2014 Second E-rate Order*, data plans and air cards for mobile devices are eligible only in instances when the school or library seeking support demonstrates that the individual data plans are the most cost-effective option for providing internal broadband access for mobile devices at schools and libraries. Applicants should compare the cost of data plans or air cards for mobile devices to the total cost of all components necessary to deliver connectivity to the end user device, including the cost of Internet access and data transmission service to the school or library. Seeking support for data plans or air cards for mobile devices for use in a school or library with an existing broadband connection and wireless local area network implicates the E-rate program's prohibition on requests for duplicative services.

Off-campus use, even if used for an educational purpose, is ineligible for support and must be cost allocated out of any funding request.

Managed internal broadband services, such as managed Wi-Fi, are eligible only for Category Two support.

Connections between buildings of a single school – The classification of connections between multiple buildings of a single school is determined by whether the buildings are located on the same campus. A "campus" is defined as the geographically contiguous grounds where the instructional buildings of a single eligible school are located. A single school may have multiple campuses if it has instructional buildings located on grounds that are not geographically contiguous. Different schools located on the same grounds do not comprise a single campus. The portion of the grounds occupied by the instructional buildings for each school is a campus for that school.

- Connections between buildings on different campuses of a single school are considered to be Category One digital transmission services.
- Connections between different schools with campuses located on the same property (e.g., an elementary school and middle school located on the same property) are considered to be Category One digital transmission services, unless they share the same building.
- Connections between buildings of a single school on the same campus are considered to be Category Two internal connections.

Network equipment with mixed eligibility – On-premises equipment that connects to a Category Two-eligible LAN is eligible for Category One support if it is necessary to make a Category One broadband service functional. If the price for components that enable the LAN can be isolated from the price of the components that enable the Category One service, those costs should be cost-allocated out of the Category One funding request.

Miscellaneous

As described below, various miscellaneous services associated with Category One or Category Two are eligible for support. Applicants should request eligible miscellaneous services in the same category as the associated service being obtained or installed.

Fees

Fees and charges that are a necessary component of an eligible product or service are eligible including:

- Change fees
- Contingency fees are eligible if they are reasonable and a regular business practice of the service provider. Contingency fees will be reimbursed only if the work is performed.
- Freight assurance fees
- Lease or rental fees on eligible equipment
- Per diem and/or travel time costs are eligible only if a contract with a vendor for the eligible product or services specifically provides for these costs
- Shipping charges
- Taxes, surcharges, and other similar, reasonable charges incurred in obtaining an eligible product or service are eligible. This includes customer charges for universal service fees, but does not include additional charges for universal service administration.

Installation, Activation, and Initial Configuration

Installation, activation, and initial configuration of eligible components are eligible. These services may include:

- Design and engineering costs if these services are provided as an integral component of the installation of the relevant services
- Project management costs if these services are provided as an integral component of the installation of the relevant services
- On-site training is eligible as a part of installation services but only if it is basic instruction on the use of eligible equipment, directly associated with equipment installation, and is part of the contract or agreement for the equipment. Training must occur coincidently or within a reasonable time after installation.

APPENDIX H

Pepperdine University IRB Approval Letter

Study Approved April 9, 2018

Pepperdine University
24255 Pacific Coast Highway
Malibu, CA 90263
TEL: 310-506-4000

NOTICE OF APPROVAL FOR HUMAN RESEARCH

Date: April 09, 2018

Protocol Investigator Name: Brett Stoneberger

Protocol #: 17-11-680

Project Title: THE NATURE OF E-RATE POLICY CHANGE, APPLICATION PROCESS AND CHANGE, AND FUNDING: ITS INFLUENCE ON E-RATE USAGE OVER TWO DECADES

School: Graduate School of Education and Psychology

Dear Brett Stoneberger:

Thank you for submitting your application for exempt review to Pepperdine University's Institutional Review Board (IRB). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46.101 that govern the protections of human subjects.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Since your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at community.pepperdine.edu/irb.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Sincerely,

Judy Ho, Ph.D., IRB Chair

Pepperdine University
24255 Pacific Coast Highway
Malibu, CA 90263
TEL: 310-506-4000

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives

Mr. Brett Leach, Regulatory Affairs Specialist