MSLN Annual Report

December 3

2010

Report from the Maine State Library and the Maine Department of Education to the Maine Public Utilities Commission for Funding Year 2011 (July 1, 2011 through June 30, 2012)

Maine School and Library Network

Prepared by Networkmaine

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Overview

The Maine Public Utilities Commission (MPUC) requires that the Maine State Library (MSL) and the Maine Department of Education (MDOE) present to the MPUC an annual plan that addresses how Maine Telecommunications Educational Access Fund (MTEAF) funds will be spent to address the connectivity needs of Maine schools and libraries. The Executive Director of Networkmaine was tasked with this responsibility on behalf of the MDOE and MSL by the Networkmaine Council and respectfully submits this Annual Report for FY 2011. This report, highlights the successes of the Maine School and Library Network Project over the past year, details how the requested funds will be spent to address the connectivity needs of Maine Schools and Libraries in the year to come, and includes the MDOE and MSL's request for Maine Telecommunications Educational Access Fund (MTEAF) funds.

Schools and libraries face the dichotomy of having the greatest need for bandwidth while being the least able to pay for it. However, thanks to the MTEAF and to Networkmaine successfully negotiating favorable contracts with three transport providers, FairPoint Communications, Oxford Networks, Time Warner Cable New England, the bandwidth needs of both schools and libraries are or will be met. The transport medium to deliver bandwidth has largely been converted from legacy solutions, i.e. T1's, DS3's, ATM, etc, to more modern carrier Ethernet services. True carrier Ethernet is not available in all regions of the state and is therefore being simulated over legacy T1 services. As stated in last year's report, increasing the bandwidth available to our schools and libraries will be an evolutionary, not revolutionary, process.

While great progress has been made in the past year, further progress still needs to be made. This transition will take time, but as community anchor institutions schools and libraries have helped drive the expansion of broadband services into communities by simply demonstrating their need for bandwidth through the RFP process. The new contracts for services not only ensure many, if not all, schools and libraries have the bandwidth they need to meet their educational and community service goals they have also allowed the services providers to expand their offerings to residential and small business customers. Multiple examples of how MSLN has aided such expansions are provided later in this report. It is worth noting that the transport contracts for MSLN not only involve every Incumbent Local Exchange Company (ILEC) in Maine through the FairPoint contract but were also assigned to a Cable company, and a Competitive Local Exchange Company (CLEC). This represents the widest engagement of Maine's communications industry in the history of the MSLN Program.

MSLN has also delivered enormous societal value to the citizens of Maine, not only in the past year, but throughout the history of the project. The public libraries have acted as Internet access points helping those who cannot afford broadband at home or are out of work apply for jobs and file for governmental aid on-line. The MARVEL! databases have proven to be a resource rich in information that are available not only through the public libraries and schools but to all of Maine's citizenry with Internet access at home. The schools have been able to bring STEM[1] related resources, experts and activities into their classrooms enriching the educational experience for their students and encouraging the next generation workforce to follow carrier paths into these fields. The value of the MSLN Program and other programs like it has also been recognized nationally.

[1] Science, Technology, Engineering, and Mathematics

Larry Strickling, Assistant Secretary of the National Telecommunications and Information Administration for the U.S. Department of Commerce recently said in reference to the BTOP program:

> "So what have we learned from round one and where do we expect to end up with this program?... what we learned from our first round applications helped us focus in on what we think are the key types of projects that we funded in round one and will continue to fund in round two. First, we learned that when talking about unserved and underserved areas, there is a huge difference in the needs of the anchor institutions and the needs of families and small businesses. The anchors—the schools, libraries, hospitals and government facilities—have needs for faster and faster speeds, as well as services such as dark fiber capacity, and we could not evaluate how well they are served in an area just by looking at the consumer market…
>
> We concluded that investing in [projects] that bring high-speed Internet access to communities and connect key anchor institutions, such as schools, libraries, community colleges and hospitals, to the Internet allows us to get the most bang for every grant dollar. We call these projects "comprehensive community" projects. … By bringing the necessary bandwidth into a community and connecting the key community institutions, we … encourage people to discover the benefits of broadband access at work or at school, making them more likely to adopt broadband at home."[2]

One can surmise from these statements that the very existence of the MSLN Program and the statewide collaboration that the formation of Networkmaine represents had a significant impact on the NTIA. In fact, two of the three BTOP awards made in Maine are directly tied to the MSLN Program.

The NTIA not only chose the Three Ring Binder Project as one of the first two BTOP awards to be announced, they highlighted the project by having U.S. Secretary of Commerce Gary Locke come to Maine to announce the award. A major focus of the Three Ring Binder project is to bring fiber optic connectivity to community anchors, including schools and libraries, throughout Maine.

In round two of BTOP funding, the NTIA chose the Maine Public Library Information Commons Project submitted by MSL to received funding. This project will upgrade public computer centers at as many as 107 public libraries statewide and increase the number of available broadband workstations by as much as 41% by deploying approximately 500 new workstations. It will also provide and enhance training opportunities by deploying 11 video conferencing regional hubs and three mobile computer labs to enable hands-on training in remote rural locations. MSL's partners in this project include: Maine Information Network; Access to Justice; Maine Department of Labor, Center for Workforce Research and Information; and Maine InfoNet.

The MDOE and MSL recognize the central role Maine's schools and libraries play in their local communities and how vital high speed Internet Access is in enabling them to fulfill their missions. Therefore, for Funding Year 2011 (July 1, 2011 – June 30, 2012), the MSL and

[2]Strickling, Lawrence E., Broadband policy Summit VI, Washington DC, June 11,2010 - http://www.ntia.doc.gov/presentations/2010/BroadbandPolicySummitVI_06112010.html

MDOE respectfully submit the following recommendations for funding to the Commission for its consideration:

Recommendations for Funding Year 2011-2012

I. Continued Funding for Services

The MSL and the MDOE ask continued funding for services to all qualified schools, Adult Education and libraries pursuant to 35-A M.R.S.A. § 7104-B(1) (referred to as MSLN) as further described below. In addition, MSL and MDOE ask that the MPUC consider better aligning the MTEAF with the federal E-Rate Program by supporting the costs of transport services to non-instructional facilities (NIFs).

Since 2004 the federal E-Rate program has provided reimbursement of transport services costs for NIFs. "Examples of non-instructional facilities [for schools] include, but are not limited to, administrative buildings, school bus barns and garages, cafeteria offices, and facilities associated with athletic activities. Examples of non-instructional facilities [for libraries] include, but are not limited to, administrative buildings, bookmobile garages, interlibrary loan facilities, and library technology centers."[3]

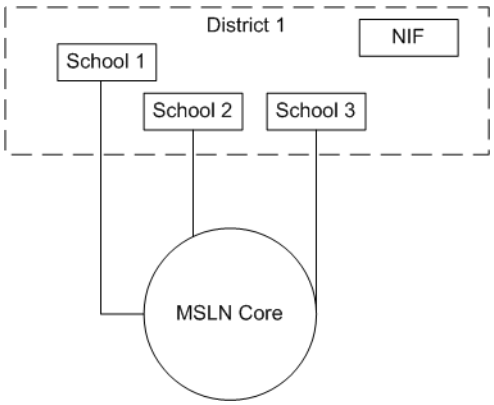


Figure 1 – Historic Model

In past years the disparity in program rules did not impact MSLN to a great extent as connectivity was provided between individual schools and libraries buildings and the MSLN network core. (Figure 1) However, now that many school districts and some library systems are moving toward a wide-area-network model with a single shared uplink to the MSLN network core (Figure 2), the difference in program rules causes unintentional administrative and technical complexity that can be avoided by aligning the federal and state level programs.

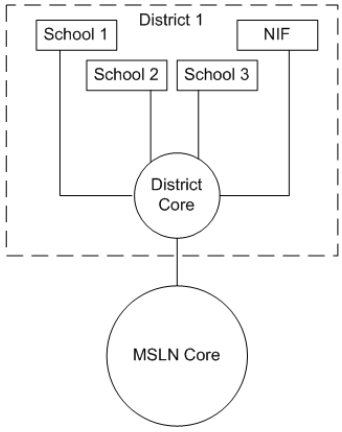


Figure 2 – WAN Model

The MSL and the MDOE estimate that the financial impact on the MTEAF will be minimal and can be absorbed without an increase in total funding over the 2010-2011 request.

A. Transport Services

Assuming Federal E-Rate will pay a minimum of 68% for approved schools and libraries, it is anticipated that Transport Services will be able to be provided at a cost to the MTEAF that is 10% above the adjusted budget for the 2010-2011 funding year. This increase is due to an increase in the anticipated number of participants, including support for NIFs, and normal yearly growth in bandwidth demands.

[3] http://www.usac.org/sl/applicants/step06/educational-purposes.aspx

Anticipated impact on MTEAF is $ 1,869,000

B. Internet Access Services

Assuming Federal E-Rate will pay a minimum of 68% for approved schools and libraries, it is anticipated that Internet Access Services will be able to be provided at a cost to the MTEAF that is 54% above the adjusted budget for the 2010-2011 funding year. The primary reasons for the increase in this area are the normal yearly growth in bandwidth demands and a restructuring in this year's funding request to include the funds previously dedicated for Internet Access for Libraries that chose not to comply with Federal E-Rate's filtering requirements. As Internet Access Services are now acquired at the overall MSLN Program level rather than by individual schools and libraries it provide a clearer picture of true Internet Access Services costs by combining the two previously separate requests.

As was the case last year, only the E-Rate eligible part, roughly 50%, of the Internet Access contract(s) negotiated by Networkmaine are included.

Unlike past years, the MSL and MDOE are not asking for separate funding for libraries that choose not to implement content filtering incompliance with the CIPA law. Rather the amount previously budgeted separately has been incorporated in the Internet Access Services line item in this year's request. See Section V below for further explanation of this change.

Anticipated impact on MTEAF is $ 85,000

C. Circuit Rider

In past years, the MTEAF supported the "circuit rider" program which provides support by phone, e-mail, and onsite visits to assist schools and libraries that do not have on-site technical support as a separate line item. The program has continued to be extremely effective, with positive and appreciative support from many of our small schools and libraries. Without this program many smaller schools and libraries would be without the ability to effectively use technology. The MSL and the MDOE propose continuation of the services provided through this program.

As of last year, the services provided through the "circuit rider" program have been managed and provided by Networkmaine as part of the operational services it provides. This change in structure has brought greater continuity and consistency of support services to the schools and libraries. Rather than requesting distinct funding for this service, the MSL and MDOE have included the cost of onsite support in the Operational Services request included below.

Anticipated impact on MTEAF is $ 0

D. CIPA Compliant Content Filtering

The MTEAF currently supports the full cost of providing a centrally managed content filtering solution that helps meet the requirements of the federal Children's Internet Protect Act (CIPA) while minimizing the administrative and technical burden on the schools and libraries. While CIPA compliance is a requirement to receive e-rate reimbursement for Internet Access Service, solutions for meeting the requirement are not eligible for e-rate funding.

Networkmaine is currently in the process of evaluating a two pronged approached to providing content filter for the schools and libraries. For larger schools and libraries, the JoeBox M-Series will be leveraged to provide content filtering. For smaller schools and libraries a new cloud-computing based content filtering service may be used to deliver content filtering. This service not only has feature parity with the current filtering solution it eliminates both the fiscal and administrative burdens of maintaining servers to run the content filtering software.

The evaluation of this approach and the cloud-based solution is not complete at this time. However as the primary purpose of these efforts is to deliver a content filtering solution at a lower cost, it will not be implemented unless it can be done at the same cost or lower than the current filtering solution. As such, the MDOE and MSL are requesting the same level of funding for content filtering for funding year 2011-2012 as for approved for funding year 2010-2011.

Anticipated impact on MTEAF is $ 105,000

E. Content Databases and E-Discovery Solution

The MSL and the MDOE recommend the continued subscription of electronic databases and E-Discovery solution to provide statewide access for citizens through MARVEL!, Maine's Virtual Library, as permitted by 35-A M.R.S.A. § 7104-B. See Appendix A for MARVEL database usage.

MARVEL!
Funding for the MARVEL! databases comes from most of its patron base. MTEAF provides funding on behalf of the public libraries and K12 schools. Additional funding is also provided by the University of Maine System, Bates, Bowdoin and Colby colleges, and the state general fund through the Maine State Library. Appendix B provides the details of the MARVEL! funding sources and related expenses.

E-Discovery
Prior to the implementation of OneSearch, located online at http://maine.gov/onesearch, library users in Maine faced challenges in selecting the appropriate resource for their research – to the average researcher, the MARVEL! databases present an often confusing array of options. OneSearch, powered by Serials Solutions' Summon™ technology, now provides residents of the state a much needed 'Google-like' single starting point from which the full depth and breadth of the collection – both licensed electronic content and physical items – can be discovered. Combining content from the MARVEL! databases with the MaineCat statewide catalog, OneSearch not only provides a single-search-box interface to the wealth of content available at Maine libraries, it

provides a consistent look and feel to researchers, and allows advanced researchers to refine the combined result sets in ways never before possible.

The Summon™ technology and the breadth of indexing that powers OneSearch far outstrips previous technologies that attempted to provide a unified search interface, particularly in areas of user experience and satisfaction, speed of results, consistency of results, completeness of results, and ability to manipulate result sets for further searching.

One unique aspect of this service is the ability to include and highlight locally important content. For example, Maine Historical Society's Maine Memory Network collection of digitized photographs now available through OneSearch which have never previously been discoverable through MARVEL! or other statewide library resources. Other important features of OneSearch include a mobile interface, putting library resources into the hands of cell phone internet users, and the ability for libraries to add search boxes to their own websites providing access to the full breadth of statewide library resources.

OneSearch is a cutting edge service that remains the only statewide implementation of the technology that is typically found only at top tier universities and colleges.

The MSL and the MDOE recommend increasing the funding for the MARVEL! content databases and Summon™ E-Discovery Solution by $5,000 this year to help cover a portion of the increased cost ($57,599) of the database subscription services. MSL, MDOE, and other supporters of the MARVEL! database subscription services will be asked to contribute additional funds to cover these cost increases. The Networkmaine Council considered asking the MPUC for an additional $50,000 from MTEAF to maintain the current level of databases. In the end the Council reached a consensus that it was more appropriate to ask the MPUC for an additional $5,000 and seek the remaining funds from the institutions currently using the databases. Please see Appendix B for additional details.

Anticipated impact on MTEAF is $ 650,000

F. Technical Services

Expenses for technical services that are not E-rate eligible are included as part of this Technical Services category if they are not specifically spelled out in a separate funding request. These services include but not limited to, constituent premise equipment (CPE) ($120K), construction costs for fiber optic entrances to schools and libraries ($46K), Internet 2 Secondary Group Participant fees ($34K), hardware and software maintenance fees for core networking equipment ($80K), and other third party equipment and services ($210K).

In addition, the MSL and the MDOE leverage MaineREN, Maine's Research and Education Network, as the optical backbone for MSLN ($69K). A 2.5 Gbps optical transport is dedicated for aggregating the traffic to/from the K12 schools and public libraries between MaineREN's optical nodes. Participating schools and libraries also share a 10 Gbps optical transport with other MaineREN participants to connect to both Internet 2 and one of the two contracted Tier 1 Internet Service Providers (Cogent Co.) out of Cambridge, MA.

Anticipated impact on MTEAF is $ 559,000

G. Operational Services

Networkmaine provides the day to day operation and end user support for MSLN. These Operational services include Network Operations Center support services including:

- network monitoring
- problem tracking and resolution
- constituent premise equipment (CPE) configuration
- transport and Internet Access vendor service provider management
- network upgrade and installation management
- technical security services
- onsite technical support through the "Circuit Rider" program

In addition Networkmaine provides schools and libraries with network design consultation, unlimited e-mail accounts with spam and anti-virus scanning, web site hosting, web content filtering, Domain Name Services, DHCP services, and IP address management.

As mentioned earlier in this report, the services provided through the "circuit rider" program have been managed and provided by Networkmaine as part of the operational services they provide. For funding year 2011-2012 the MSL and MDOE have included the cost of these onsite support services in this Operational Services request.

$510,000 of this request will go towards the salary and benefits of the Networkmaine personnel who provide these services with the remainder to be used for travel ($30,000), shipping, and miscellaneous office expenses ($16,000). The MSL and the MDOE request that MTEAF funds be made available to cover the costs to operate MSLN.

Anticipated impact on MTEAF is $ 556,000

II. Alternative Equivalent Value (AEV) for Transport Services

Historically, when schools and libraries procured transport services at equal to or greater bandwidth at equal to or less cost than what would have been provided by the existing negotiated MSLN contracts, MTEAF would reallocate funds at the same level of MTEAF support for MSLN. An example of such a situation was the schools and libraries that had contracted for ATM transport services. Given the flexibility in the transport contracts negotiated by Networkmaine schools and libraries are no longer faced with procuring their own transport services in order to get their bandwidth needs met. Therefore the MSL and MDOE are not requesting funding for an Alternative Equivalent Value Program for Funding Year 2011 (July 1, 2011 – June 30, 2012).

Anticipated impact on MTEAF is $ 0

III. Administrative Services

The MSL and the MDOE contribute $643,000 towards the administrative costs of MSLN through a Cooperative Agreement between the University and MDOE for support of MSLN.

A. Fund Administrator

The MSL and the MDOE ask that the Commission re-authorize the expenditure of funds to pay for a fund administrator to assess carriers, collect funds from carriers and make payments from the Fund (as permitted by 35-A M.R.S.A. §§ 7104-B(2) and 7104(3)).

Anticipated impact on MTEAF is $ 26,400

B. E-Rate Application Process

Networkmaine manages the certification of the federal E-Rate paperwork rather than hiring an outside consultant to provide that service. This past funding year, and in use once again this funding year, Networkmaine created a web based E-Rate Assistance tool located at http://www.networkmaine.net/erate. This tool has allowed Networkmaine to greatly computerize and automate the data collection and form completion process. No longer are the schools and libraries asked to manually fill out information on paper forms that are readily available in both federal and state government data sources. Instead this data is automatically incorporated into the forms greatly reducing the chance of human error. The participating schools and libraries only need to fill out their site specific information on the web site and confirm various certifications. Once completed the schools and libraries download the various forms (Letters of Agencies, Form 479s, etc…) from the web site which are already filled out with all the appropriate and provided information ready for them to sign and return to Networkmaine.

The E-Rate Assistant tool was well received last year. Networkmaine is making additional improvements to the tool for this year's E-rate filing efforts to incorporate feedback received last year. Modifications will also be made to reflect the changes in the E-Rate Program for the coming funding year.

FCC Order 10-175 issued in September 2010 has drastically improved the E-Rate program for the FY2011 funding year. Not only has the FCC "Index[ed] the cap on E-rate funding to inflation in a fiscally responsible manner, so that the program can more fully meet the needs of students and communities" [4] it has made multiple changes to simplify the filing process. No longer are schools and libraries required to have technology plans to qualify for reimbursement for Telecommunications or Internet services, both referred to as Priority 1 services. The Form 470 and 471 have also been greatly simplified to further ease the filing process. While none of the changes directly address the unique challenges of filing as a consortium, the changes made will reduce the data collection requirements that cause much of the challenges of participating in the E-Rate program.

C. Contract Management

Networkmaine successfully negotiated five years contracts for transport services with three services providers; FairPoint Communications, Oxford Networks, and Time Warner

[4] http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301649A1.doc

Cable New England and a three year contract for Internet Access Services with Time Warner Cable New England. The entire procurement process from writing the RFPs to final contract negotiations was managed by the University of Maine System's Strategic Procurement Office. As the University of Maine System is the customer of record on all four of these contracts, its Strategic Procurement Office will continue to ensure that the contracts are adhered to and will maintain all required documentation related to the contacts for seven years after their service term as required by the E-Rate program rules. It will also manage all procurement efforts for additional services in the future.

D. Invoicing

Networkmaine handles all invoicing activities related to MSLN. These activities include receiving the invoices from the contracted service providers, verifing their accuracy, submitting the invoices for reimbursement from both the MTEAF and the E-Rate Program, reconciling payments, and maintaining records for the time frame required by the E-Rate Program rules. Networkmaine leverages UMS' Accounts Payable department and their electronic document management and imaging system for many of these activities.

E. Budgeting and Financial Management

Networkmaine is being assisted by the University of Maine System's Director of Sponsored Programs and Administration. The MSLN Program is being fully budgeted and accounted for by knowledgeable and trained staff on an accrual basis following generally accepted account principals (GAAP). As such there will be a much more accurate understanding of what the MSLN Program costs on a fiscal year basis.

Anticipated impact on MTEAF is $ 0

IV. Libraries Choosing Not To Filter

In 2004, the Legislature amended 35-A M.R.S.A. § 7104-B(6) to allow public libraries to decline Federal E-Rate for internet service if they determine that applying for Federal E-Rate (e.g., complying with Federal E-Rate's filtering requirements) would substantially compromise the library's standards or mission. The statute allows the Commission to mitigate the loss of Federal E-Rate funds using the MTEAF.

Since the 2004-2005 funding year the MPUC has allowed non-filtering libraries to contribute $25 per month toward the cost of Internet service with MTEAF paying the remainder of the amount that would typically be paid for by federal E-Rate. Under the current Internet Access contract this model of cost sharing is no longer relevant.

The cost of Internet Access Service is no longer incurred on a per site basis but rather it is based on the size of the Internet connections servicing the entire network. For Funding Year 2011 (July 1, 2011 – June 30, 2012), it is anticipated that 50 libraries will chose not to filter. The impact of these 50 E-Rate ineligible libraries on the overall discount level for Internet Access is negligible. Therefore, the additional MTEAF subsidy that has historically been approximately $ 28,000 annually has been rolled into the Internet Access Services funding request above.

Anticipated impact on MTEAF is $ 0

Innovative and Technologically Advanced Program

Title 35-A M.R.S.A. § 7104-B(5) requires that "[a] minimum of 25% of each annual program budget must be devoted to targeted projects that are innovative and technologically advanced." The MDOE and MSL met this requirement for the current funding year by supporting the innovative use of MSLN, technologically advanced transport services, and the innovative approach to investing in broadband expansion throughout the state and recommend a similar approach to meeting this requirement for the 2011-2012 funding year.

I. Innovative Use

Innovative or technologically advanced applications are enabled by high speed network connections and 1-to-1 computing initiatives, like MLTI. The National Science Foundation (NSF) funded Innovative Technology Experiences for Students and Teachers (ITEST) projects like the *EcoScienceWorks* Project[5] and the *Inquiry-based Dynamic Earth Applications of Supercomputing* (IDEAS) Project[6] along with the Maine EPSCoR *Sustainability Solutions Initiative* (SSI) are focused on engaging middle and high school students and their teachers in University level research.

Figure 3 – A Greely High School teacher (on computer) interacts with students during a recent ITEST project presentation night at Hampden Academy

A. Citizen Science – Workforce Development

The Maine EPSCoR's SSI Strategic Plan outlines a holistic approach to workforce development – education, employment, and economic development are all important components of the process of creating a STEM workforce to ensure Maine's future. A primary strategy within their workforce development strategy includes K-12 outreach for students and teachers to develop the workforce "pipeline".

[5] **EcoScienceWorks** is an NSF ITEST project for seventh and eighth grade science teachers and students in Maine. Its major goal is to develop computer-based curriculum for the Maine laptop program that will spur student interest in computer modeling in science. http://www.fbr.org/swksweb/esw.html

[6] **IDEAS** connects researchers at the University of Maine with students and middle school teachers, both at the University (during a summer workshop) and at participating schools (during the academic year) to utilize computer modeling and visualization of geological processes in the classroom. IDEAS has 60 participating teachers as well as 180 students. The focus of this project is to integrate computational modeling with the existing science curriculum at the middle school level. This is accomplished largely by collectively utilizing existing laptop computer computational power and networking capability to run computer models, both locally and at the University supercomputer, and to create high resolution interactive visualization displays (from the same laptops) to view the output. http://arch.eece.maine.edu/ideas/index.php/Main_Page

Since Maine consistently ranks last in the nation in earned doctorates in science or engineering (NSF 2006 survey), the overall goal for Maine EPSCoR workforce development is to foster the current and next generations of sustainability science professionals. This goal will be accomplished, in part, by directly linking K-20 programs to the diverse challenges and opportunities in this emerging field and expanding capacity for knowledge dissemination for all levels. Specific workforce development strategies as well as corresponding educational outreach and human resource development strategies will be utilized. The complete spectrum of Maine EPSCoR's SSI workforce development activities are enhanced by the existing of high speed connectivity provided through the MSLN Program.

Some specific SSI workforce development activities of the SSI research and education project directly benefit from the MSLN Program. These include:

1) Maine EPSCoR High School Research Internship Program: 25 high school students work with SSI faculty, assisting researchers and presenting the results of their collaborations in both reports and public seminar presentations.
2) Maine STEM Collaborative: Maine EPSCoR is a founding member of the Maine STEM Collaborative, which is a statewide partnership of education, research, business, government, and non-profit sectors who have come together to foster the improvement of STEM education in the state. Workforce development and outreach activities in all Maine EPSCoR SSI projects are aligned and coordinated with the statewide goals and strategies of this group. Of particular note, the third STEM Summit will be sponsored in fall 2011 for over 300 live participants and will be streamed to many schools around the state via MSLN.
3) K-12: Maine's K-12 schools and libraries have over 400 videoconferencing units on mobile carts and licensing for over 500 laptops for software based videoconferencing clients in use. When one adds this large videoconferencing presence with the Maine Learning Technology Initiative (MLTI) and MSLN, it is easy to see that there is enormous potential for STEM education and creating the next generation IT-literate workforce. SSI aims to help remove impediments to interaction between K-12 and the research community and allow for the development of programs such as a pilot "Virtual Researcher in the Classroom" by June 2013.

B. Cloud Computing – SaaS

With the investments already made by the MDOE in one-to-one computing and the additional bandwidth installed over the past year, schools now have the necessary tools to be able to make use of cutting edge solutions not only based within Maine but also available on the Internet.

Cloud Computing based solutions like Google Apps for Education and Studywiz facilitate a more collaborative learning environment while removing the cost and burden associated with maintaining the software and servers to deliver such applications locally. Utilization of these services and others has taken off since the bandwidth upgrades have been installed.

> "Our additional bandwidth came at just the right time. More use of Google Apps began to slow our network down. [We will be able to save] $5000/year

on Microsoft Office because the additional bandwidth makes our Google Apps work smoothly. Thanks!"[7]

"We have used Google Apps for years now and over the summer we were upgraded to 10 Mbps download. Ever since this upgrade I have had no complaints regarding Google Apps functioning the way it should. Users in the past were complaining that when they had to share a document it would take some time for Google to "refresh" their work and have it appear with the other collaborators. Prior to the upgrade when an entire lab would be using Google Apps this issue was even more pronounced. I would like to thank MSLN and Networkmaine for the infrastructure that they have provided our school."[8]

Software as a Service (SaaS) solutions like Infinite Campus, that has been contracted for by the MDOE and has been implemented by schools across the state, provides for a state-wide student information system that allows for better tracking of students that move between districts, better trend analysis over time, and faster intervention with at risk students.

"[MSLN] is allowing MSAD75 staff to access Infinite Campus, the district's student information system, in order to provide ready access to academic data for response to intervention (RTI). Teachers are able to input the reading scores of every child at least three times or more per year, and thus document the accuracy, fluency, and overall comprehension of student reading skills. Teachers are able to access an entire history for students, complete with what instruction has been most successful. By having access to this type of data, teachers are better equipped to identify students before they fall behind. Previously, hours were spent digging through files to determine this data. Because of [MSLN], critical information is now available at the click of a button."[9]

C. eLearning

Video based distance learning still plays a major role in Maine's K-12 schools as is demonstrated by the number of USDA/RUS Distance Learning and Telemedicine Grants that have been awarded to Maine's schools over the past few years (http://www.livec.org/Map.aspx). These grants have provided for distance learning technology to almost 400 schools state-wide and total over $5 Million[10]. The ability to bring in researchers and other remote experts and deliver virtual fieldtrips to Maine's students has proven to be extremely valuable in augmenting the traditional classroom experience at all grade levels. However, due to limited bandwidth available in the past many schools had been limited to just one video conference running at anytime and even then often at lower video quality. The increased bandwidth delivered over the fiber-based services has allowed for higher quality video and the ability to have more than one class using the technology at any one time.

[7] Waynefleet School
[8] Glenburn Elementary School
[9] MSAD 75 Literacy Specialist
[10] http://www.rurdev.usda.gov/SupportDocuments/dltawards-me.pdf

D. Library Services

The success of **the** P**ublic** C**omputer** C**enter** BTOP grant received by MSL from the NTIA depends on the availability of high bandwidth at the libraries. According to an NTIA program officer, one reason MSL received this grant is because of its partnering with state agencies and other organizations. This partnering is **seen as** an innovative approach to reaching and educating Maine citizens through its public libraries. **These partnerships have enabled the delivery of Library S**ervices to Maine's citizen**s** over MSLN in a variety of innovative ways.

OneSearch

Once again this year MSL and MDOE are requesting funding for the Summon™ E-Discovery service which powers OneSearch. This tool has proven to be extremely successful in making the MARVEL! content databases more accessible to Maine's citizens. No longer do they need to know or understand the structure of proprietary database subscription services. Rather they are now given a single search tool with a look and feel similar to commonly available public search sites to find the information that they are looking for.

Summon™ is proving to be a game changer for Maine's 21st century libraries. It has increased the use of the MARVEL! databases by allowing users to easily search the breadth of the collections. The ease of use of OneSearch has turned the library search experience into one as fast as searching on the public Internet.

Downloadable E-Books and Audiobooks

The Maine State Library, in partnership with Maine InfoNet contracts with Overdrive to offer online access to downloadable audio books and now e-books through local libraries using a library lending model. Audio books can be burned to a CD (where permitted by publisher) and/or transferred to hundreds of supported audio devices such as MP3 Players, IPods (where permitted by publisher) or Zune players. eBooks are designed for transfer to devices that support the ePub format. These devices include the Nook, the Sony eReader, and the Kobo, among others. Membership Fees for libraries are based on population served, regardless of type of library. Academic libraries base the population on the head count of students, faculty and staff.

WebJunction Maine

The Maine State Library continues it relationship with nationally recognized library portal Webjunction. Through the WebJunction Maine Custom course catalog, Maine library staff, volunteers and trustees can enroll in online courses. All Maine libraries are welcome to participate: public, school, academic, and special libraries. As online courses incorporate more video and audio components the high speed connections now available at Maine libraries provide the needed bandwidth for online learning for Maine library staff. WebJunction Maine's custom course catalog is available at: http://me.webjunction.org/. Over 200 online courses are taken annually through WebJunction Maine.

Web Conferencing

Through the State of Maine Office of Information Technology, the Maine State Library has three rooms of *Adobe Connect Pro* to provide web conferencing to Maine libraries for webinars and web meetings. With the higher bandwidth now available at the libraries, VoIP and video can now be included as part of the web conferences.

II. Advanced Technology Infrastructure

The fiber-based transport services are part of the next generation networks (NGNs) being deployed by Maine's communications providers. These networks are hugely scalable and have flexibility well beyond what has been available on traditional time division multiplexing (TDM) networks. These fiber-based transport services provide not only the bandwidth needed for the schools and libraries to meet their educational and public service goals in new and innovative ways but the services themselves are based on modern, advanced technologies, often referred to as "carrier grade Ethernet" or "Metro-Ethernet" that have not been available to MSLN participants in the past.

These NGN's are able to easily and cost effectively "right size" the speed of a connection ranging from 10 Mbps to over 1000 Mbps on the same fiber-based transport medium independent of the increments required by traditional TDM based services. As such, the schools and libraries are not faced with large incremental jumps in costs at certain bandwidth thresholds. For example, in the past it had been difficult and costly for a MSLN site that needed more than 3 Mbps to increase their available bandwidth as the next practical service had to be delivered via a 45 Mbps DS-3. With the fiber-based NGNs, bandwidth can be contracted for in increments as small as 5 Mbps

One of the other new features these NGN's deliver is providing the schools and libraries with the ability to define how their connectivity is configured. For example they now have the ability to create any-to-any communications within a school district, or other common administrative domain, allowing for the creation of wide area networks that share an uplink. Keeping local traffic local allows for greater sharing and consolidation of technical resources providing cost efficiencies for the schools and libraries. Four schools districts were converted to this new model as part of this past summer's upgrade project with another three districts scheduled for this spring.

III. Innovative Approach to Expanding Broadband Access

Beyond these direct benefits to the schools and libraries described above, Maine's public institutions play an important role in improving Maine's broadband availability. MSL and MDOE recognize that our aggregate demand for fiber optic based transport services, demonstrated in the five year contract signed with the three transport providers, has helped these service providers make the investments necessary to expand their NGNs.

The length and size of these contracts have provided the transport providers with the type of long term commitment they need to invest in the expansion of their broadband infrastructure enabling them to provide better, faster, and less expensive broadband services to the residences and businesses in these communities.

In order to deliver the contracted transport services to the schools and libraries the service providers have had to make substantial investments in their broadband infrastructure. FairPoint alone has installed new broadband equipment in 130 central offices and replaced over 400 miles of interoffice fiber-optic infrastructure to meet the contract deliverables. This expansion, enabled by the MSLN contract, has had side benefits to another Maine Universal Service program.

The ConnectMaine Authority received a $100,000 proposal as part of their 4th grant round to install broadband services in the unserved community of East Blue Hill. Due to the infrastructure that FairPoint installed to deliver a 10 Mbps connection to East Blue Hill Library, they are now able to deliver broadband services to the residences and small business in the proposed service areas. FairPoint informed the ConnectME Authority of their newly available service offering and the proposal was withdrawn freeing up ConnectME Authority funds for projects in truly unserved areas of the state. Another example of how the MSLN Program has enabled transport providers to make to the investments necessary to deliver broadband services to hard to reach areas is Isle au Haut.

In order to meet the bandwidth commitment of the MSLN contract to the schools and libraries on Isle au Haut and the surrounding islands, TDS is installing a new 600 Mbps microwave link between the mainland and Swans Island. This new link represents a major investment by TDS which it is now looking to leverage to increase the services provided to the islands.

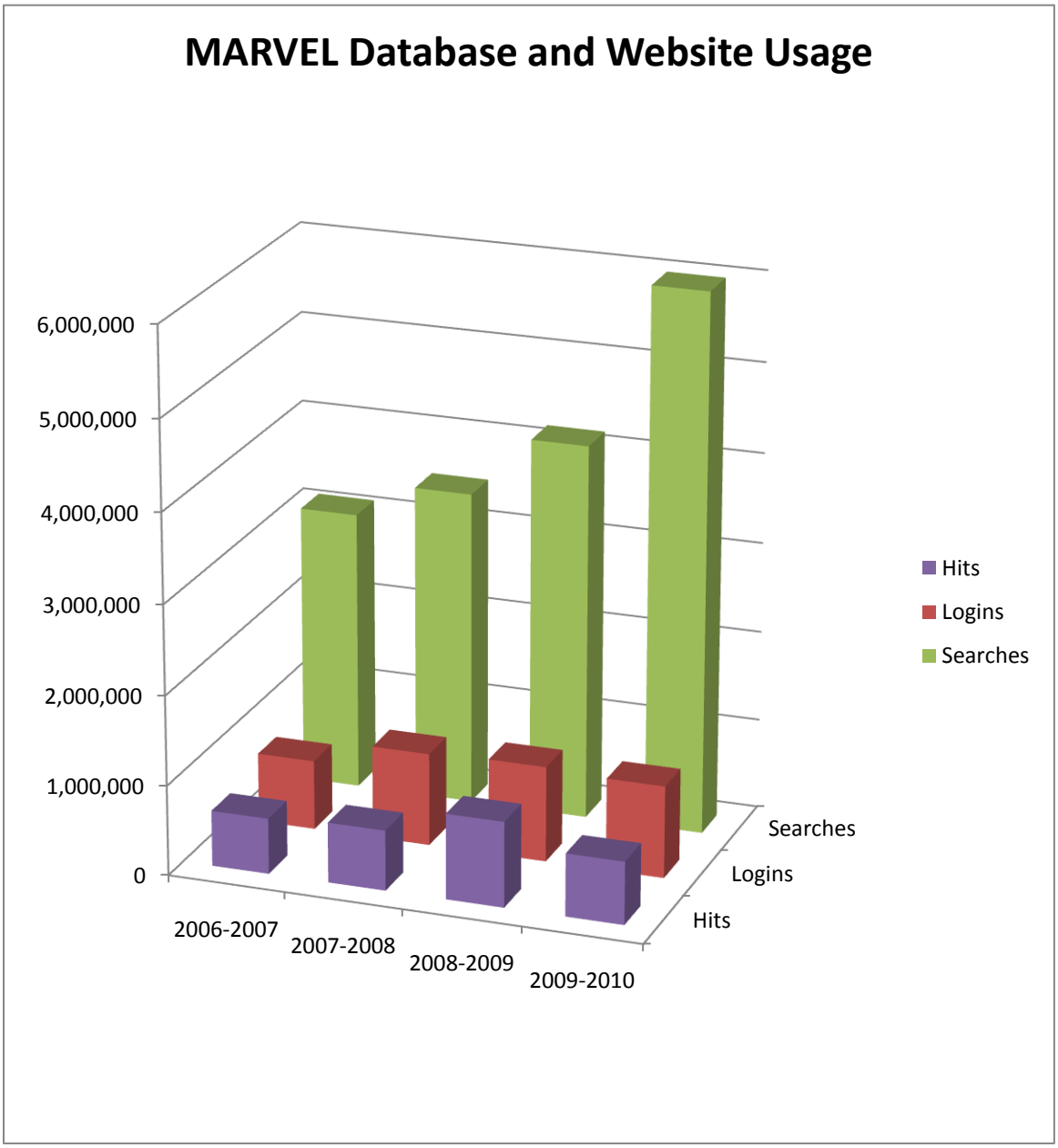
As part of the ConnectMaine Authority's 5th grant round, TDS has submitted a proposal for a $50,000 grant to provide broadband service to unserved households on Isle au Haut. TDS would not have been able to even consider submitting the proposal to the ConnectMaine Authority if it were not for the infrastructure upgrades that were enabled by the MSLN contracts.

These two examples are representative of the increased broadband availability that has been enabled at least in part by the MSLN Program. In order to meet the deliverables of the transport services contracts, the three service providers have made significant investments in their broadband infrastructure across their service territories including having installed fiber optic based transport services to more than 270 schools and libraries.

Assuming a 67% federal E-Rate reimbursement, the impact on the MTEAF that the fiber optic transport services for the 270 additional schools and libraries is $900K. The MDOE and MSL are requesting that $900K of the transport services costs and the $100K in support of the Summon™ federated library search engine, for a combined total of $1.0M be counted as meeting the Innovative and Technologically Advanced 25% requirement.

Appendix A

MARVEL Usage



MARVEL! Database Usage

	2006-2007		2007-2008		2008-2009		2009-2010	
	Logins	Searches	Logins	Searches	Logins	Searches	Logins	Searches
Jul	20868	89856	20,015	75,141	21,420	84,907	20,521	119,974
Aug	20619	69505	19,613	76,785	18,187	70,195	19,096	91,526
Sept	65363	232694	61,982	256,374	65,731	291,641	65,375	410,151
Oct	95877	366677	111,348	482,079	94,957	486,860	90,968	618,943
Nov	86,067	359,163	101,107	435,398	87,902	477,053	113,427	747,626
Dec	62,438	249,367	63,566	256,054	66,106	340,618	94,674	427,210
Jan	73,579	283,059	72,818	277,663	122,258	274,198	111,470	516,069
Feb	74,167	307,199	124,312	362,921	132,138	442,424	124,484	756,305
Mar	95,281	417,553	149,028	425,013	177,550	601,929	145,402	844,156
Apr	81,913	362,027	160,737	416,363	152,465	569,539	114,819	768,719
May	68,613	257,736	108,767	282,898	123,272	361,732	88,689	481,608
Jun	27,457	107,209	36,870	141,181	62,219	172,308	37,527	211,774
Total	**772,242**	**3,102,045**	**1,030,163**	**3,487,870**	**1,061,986**	**4,173,404**	**1,026,452**	**5,994,061**
	Percent change		**33.4%**	**12.4%**	**3.1%**	**14.7%**	**-3.3%**	**43.6%**

MARVEL! Web Site Usage

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
	Hits	Hits	Hits	Hits	Hits
Jul	20,368	18,328	24,861	15,457	15,123
Aug	21,208	20,012	21,540	17,533	17,937
Sept	44,668	46,679	74,048	56,075	54,231
Oct	69,838	71,803	88,523	72,516	65,723
Nov	62,832	66,541	100,289	73,251	
Dec	55,321	50,915	79,323	63,682	
Jan	71,814	68,198	111,136	78,379	
Feb	55,789	54,361	96,215	74,809	
Mar	71,844	78,584	114,788	89,926	
Apr	44,479	67,429	87,859	67,544	
May	71,088	77,080	87,307	62,782	
Jun	30,030	50,748	66,044	27,676	
Total	**619,279**	**670,678**	**951,933**	**699,630**	
	Percent Change	**8.3%**	**41.9%**	**-26.5%**	

	2007	2008	2009	2010
Number of databases:	49	52	52	54

Appendix B

MARVEL! Budget Summary

	FUNDING	% share FY2011		FY 2010	FY 2011 Projected	$ Variance	% Variance
1	MTEAF	53%		$645,000	$650,000	$5,000	1%
2	Colby, Bates, Bowdoin	4%		$54,000	$54,000	$0	0%
3	State Gen. Fund-MSL	22%		$275,000	$275,000	$0	0%
4	UMS	14%		$175,000	$175,000	$0	0%
5	MSL	2%		$22,000	$30,500	$8,500	39%
6	Dept. Of Education	1%		$ -	$8,500	$8,500	_
7	Other	3%		$ -	$35,599	$35,599	_
8	**TOTAL FUNDING**	100%		$1,171,000	$1,228,599	$57,599	5%
9	**LIABILITIES**						
10	**Databases**	# Databases	Notes				
11	EBSCO	23	plus other services	$512,643	$568,575	$55932	11%
12	Gale	2		$188,168	$197,576	$9,408	5%
13	ProQuest	1	Plus Newspapers and Aquatic Science in FY11	$89,465	$122,338	$32,873	37%
14	McGraw-Hill	1		$26,250	$27,563	$1,313	5%
15	Britannica	1	Several versions of encyclopedia plus related databases	$77,500	$81,375	$3,875	5%
16	CABI	1		$6,698	$7,033	$335	5%
17	OVID	1		$10,077	$10,581	$504	5%
18	Nature	1		$48,150	$50,558	$2408	5%
19	ValueLine	2		$60,000	$63,000	$3,000	5%
20	**Database Total**			$1,018,951	$1,128,599	$109,648	11%
21	**Search Tool**						
22	Serials Solutions	Summon™		$100,000	$100,000	$0	0%
23	**TOTAL LIABILITIES**			$1,118,951	$1,228,599	$109,648	10%
24	**NET BALANCE**			$52,049	$0	$(52,049)	-100%

Appendix C

Comparison of Funding Requests Fund Years 2010 vs. 2011

Services	**2010-2011** (final)	**2011-2012** (requested)
Transport Service[11]	$1,699,000	$1,869,000
Internet Service	$ 55,000	$ 85,000
Replacement CPE[12]	$ 190,000	N/A
Circuit Rider[13]	$ 120,000	N/A
CIPA compliant Content Filter	$ 105,000	$ 105,000
Content Databases & E-Discovery Solution	$ 645,000	$ 650,000
Technical Services	$ 439,000	$ 559,000
Alternative Equivalent Value (AEV)[14]	$ 64,000	$ 0
MTEAF Fund Administrator	$ 27,600	$ 26,400
E-Rate Consultant[15]	$ 55,000	$ 0
Operational Services	$ 423,000	$ 556,000
Libraries not Filtering[16]	$ 28,000	N/A
Totals:	**$3,850,600**	**$3,850,400**

[11] Cost prior to expected E-Rate reimbursement: 2010-2011 - $5,309,375; 2011-2012 - $5,840,625
[12] Funds reallocated to cover costs of various other services with the remainder included in Technical Services request for Replacement CPE
[13] Included in Operational Services request
[14] Funds reallocated to Transport Services request
[15] Funds reallocated to Transport Services request
[16] Funds reallocated to Internet Service request