
*Technology Plan
For
Las Vegas-Clark County Library District*

Prepared by Joseph Ford and Associates, Inc.

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Technology Plan For Las Vegas-Clark County Library District

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Executive Summary

The Las Vegas-Clark County Library District (LVCCLD) has enjoyed great achievements in implementing technology for its patrons and staff. The Library District is in the forefront of public libraries in this country in exploiting computers, communications, and associated equipment and software to provide services.

While LVCCLD has been successful, the Library District faces major challenges in meeting the expectations created by its successes. By being responsive to the public in acquiring materials and in providing excellent service, LVCCLD has attracted the enthusiastic attention of patrons, whose borrowing activity in the last eight years has more than doubled.

The purpose of this Technology Plan is to support continued growth of services, both in type and in volume, to the patrons of the Las Vegas-Clark County Library District.

The Technology Plan is Based on a Record of Successes

LVCCLD has sharply increased and enhanced its technology during the last five to eight years. Following are some examples of technology growth at LVCCLD:

- Many more computers for patron Internet access and for patrons seeking office function software
- Network connectivity and access to the Internet for patrons and staff, as well as connectivity between LVCCLD facilities
- Development and delivery of electronic materials such as e-books and database subscriptions
- Emphasis on common information access methods such as the World-Wide Web
- Leading-edge implementation of Radio Frequency Identification (RFID), Automated Materials Handling (AMH), and patron self-services
- Expanded use of electronic and digital services for staff functionality and efficiency, including these:
 - A PC reservation and print control system

- Use of vendor-supplied bibliographic processing systems and materials ordering systems
- Purchase and implementation of a completely new Integrated Library System (ILS), the Millennium product from Innovative Interfaces, Inc.

The three years of technology planning covered in this document will build on the very solid technology base already in place within LVCCLD.

Planning is Organized Around Four Technology Types in Use in LVCCLD

The consultant preparing this plan sees four general areas of technology investment within LVCCLD, and this Technology Plan is organized around those:

1. *The Basics: Infrastructure and Items Related to E-Rate and LSTA Qualifications*

This section of the Technology Plan deals with the technology fabric common to every large public library. As a recipient of e-rate subsidies and LSTA grants, LVCCLD is required to develop a Technology Plan and make it available to the e-rate certification organizations (The Schools and Libraries Program of the Universal Services Administrative Company). This section will support LVCCLD's obligations regarding e-rate and LSTA grants.

2. *The Big Initiative: Patron and Staff Services Investments*

This section deals with the current project to install RFID, AMH, and patron self-service features in each urban library, as well as plans for implementing a centralized automated sorting system.

3. *In Process: Maintenance and Support; Projects Underway*

This section deals with the support functions needed behind the scenes to maintain and upgrade current technology, implement new staff-oriented products and services, and migrate to a new technology support center.

4. *The Next Big Thing: Web 2.0, Digital Content, Presentation Space, and Broadcasting*

This section deals with the current and emerging environments associated with digital content, and with creating, archiving, editing, and delivering that content. In support of content creation and archiving, LVCCLD's presentation spaces (auditorium, concert hall, stages) will require investments outlined in this section.

Timeline and Estimated Costs

The time coverage for this Technology Plan is the three-year period between mid-2009 and mid-2012.

The Technology Plan recommends a number of specific tasks to be undertaken by LVCCLD and provides a recommended timeframe for each task. These tasks and times are summarized in Table 5 of the Technology Plan.

*Table ES-1: Summary Estimated Costs for the Technology Plan, 2009–2012
(This same table appears in the body of the Technology Plan as Table 6)*

Item	Description	Year One Costs	Annual Cost
1.	Section 1 cost totals: Infrastructure	\$855,039	383,896
2.	Section 2 cost totals: The big initiative	8,123,500	814,850
3.	Section 3 cost totals: In process	808,280	388,714
4.	Section 4 cost totals: Presentation	1,732,500	335,500
Totals		\$11,519,319	\$1,922,960

Technology Plan For Las Vegas-Clark County Library District

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Las Vegas-Clark County Library District: Strategic Growth and Goals

In 2003, the Las Vegas-Clark County District was named Library of the Year by *Library Journal*, for its dramatic service improvements responsive to the needs of District residents. This award was the result of very successful service changes in acquiring and making available books and other library materials that implemented the 2001–2006 Strategic Service Plan adopted in 2000 by the Las Vegas-Clark County Library District (LVCCLD—the “District”). Other Strategic Service Plans (2005–2008 and 2008–2011) emphasized staff efficiencies, capital projects, and patron services.

Those Strategic Service Plans addressed both the operational improvements needed to best serve the community and the physical plant improvements required to serve one of the fastest growing metropolitan areas in the nation. Circulation increased from 5 million in 2001 to over 12 million in 2008. Similar increases in program attendance, library visits, computer use and literacy have been experienced.

LVCCLD Service Goals

These are the LVCCLD Service Priorities from the 2008–2011 Strategic Service Plan:

- *Create Young Readers: Early Literacy.* Preschool children will have programs and services designed to ensure that they will enter school ready to learn to read, write, and listen.
- *Satisfy Curiosity: Lifelong Learning.* Residents will have the resources they need to explore topics of personal interest and continue to learn throughout their lives.
- *Stimulate Imagination: Reading, Viewing, and Listening for Pleasure.* Residents who want materials to enhance their leisure time will find what they want when and where they want them and will have the help they need to make choices from among the options.
- *Succeed in School: Homework Help.* Students will have the resources they need to succeed in school.

- *Visit a Comfortable Place: Physical and Virtual Spaces.* Residents will have safe and welcoming physical places to meet and interact with others or to sit quietly and read and will have open and accessible virtual spaces that support networking.
- *Connect to the Online World: Public Internet Access.* Residents will have high-speed access to the digital world with no unnecessary restrictions or fees to ensure that everyone can take advantage of the ever-growing resources and services available through the Internet.
- *Learn to Read and Write: Adult, Teen, and Family Literacy.* Adults and teens will have the support they need to improve their literacy skills in order to meet their personal goals and fulfill their responsibilities as parents, citizens, and workers.
- *Celebrate Diversity: Cultural Awareness.* Residents will have programs and services that promote appreciation and understanding of their personal heritage and the heritage of others in the community.

Collections and Usage

The Library District's collections grew from about 861,000 items in 1990 to over 1.6 million in 1995, and leveled off to between 2.3 million in 1999 and nearly 2.4 million in 2008. The District's circulation grew from 2.8 million in 1990 to nearly 4.6 million in 1995, to over 5.2 million in 1998, and to over 12.0 million in 2008.

Of great interest to staff who provide direct patron bibliographic services is the rapid growth of intralending, that is, borrowing items from within LVCCLD, but the loan request is for an item held in a different branch than the patron normally visits. Thus items move around the District. The advent of a new Integrated Library System (ILS) in 2005 with an enhanced World-Wide Web catalog interface is probably the reason for much of the growth, which went from 621,000 items in 2006–2007 to 1,070,000 items in 2007–2008 to a rate for 2008–2009 that will likely exceed 1,340,000. Approximately 75 percent of intraloin requests are made directly online by patrons.

The District's materials expenditure accounted for \$1.5 million in 1990, \$4.7 million in 1995 (\$2 million from the General Fund and \$2.7 million from bond funds), nearly \$4.3 million in 1999, and \$10.0 million in 2008. The District's total General Fund revenues and expenditures accounted for over \$10.1 million in 1990, nearly \$15.5 million in 1995, over \$32.1 million in 1999, almost \$41.8 million in 2003, and a projected \$55 million for 2008.

Organization

The Las Vegas-Clark County Library District is organized in a regional tier and does not have a traditional Main library. A total of 24 facilities serve over 1.5 million residents living in an area of almost 8,000 square miles. Three "hub" libraries, nine major urban libraries, and one satellite site serve 436 square miles

in the Valley's metropolitan area. Urban branch libraries were built on a 2.5-mile radius plan. Today, the populations served by these urban libraries vary greatly among this group of libraries.

Eleven outlying libraries are distributed over an area of 6,277 square miles comprising rural Clark County. The eleven outlying libraries serve largely rural towns and communities, with the exception of Laughlin and Mesquite. Laughlin is a retirement/resort community in the southeastern tip of the Clark County on the border of California and Arizona. Mesquite is one of the fastest growing small towns in America, located in the northeast corner of the county on the border of Arizona. A courier system transports materials between the urban libraries on a daily basis and to outlying areas twice weekly.

Growth in Technology Services

As with bibliographic services—that is, making books and other library materials available—LVCCLD has also made dramatic advances in the last five years in its delivery of technology-based services, both for patrons and staff. Those services include the following:

- Many more computers for patron Internet access
- Many more computers for patrons seeking office function software
- Network connectivity and access to the Internet for patrons and staff, as well as connectivity between LVCCLD facilities
- Development and delivery of electronic materials such as e-books and database subscriptions
- Emphasis on common information access methods such as the World-Wide Web
- Leading-edge implementation of Radio Frequency Identification (RFID), Automated Materials Handling (AMH), and patron self-services
- Expanded use of electronic and digital services for staff functionality and efficiency, including these:
 - A PC reservation and print control system
 - Use of vendor-supplied bibliographic processing systems and materials ordering systems
 - Purchase and implementation of a completely new Integrated Library System (ILS), the Millennium product from Innovative Interfaces, Inc.

As a result of these emphases, LVCCLD has expanded the number of computers with Internet access from about 50 in 2000 to more than 1,100 in 2009. In the same time span, the Library District has added public access computers, the PC reservation system, the new ILS, an in-house telephone system, and a staff time and attendance system.

In addition to the services LVCCLD provides for the citizens of Las Vegas and Clark County, LVCCLD also provides nearly equivalent services under contract to these other jurisdictions and organizations in Clark County:

- North Las Vegas Public Library
- Boulder City Public Library
- Nellis Air Force Base Library
- Metropolitan Corrections Center
- The Springs Preserve

Overall, the Library District's staffing levels have grown minimally, with 3 percent to 4 percent increases per year from 2000 through 2009, indicating LVCCLD's success in achieving staff efficiencies through applying technology.

Background to the 2009 Technology Plan

In the last three years, LVCCLD has become one of the most technologically advanced public libraries in this country, based on the range of technologies and services in use, the beneficial impacts on patrons and staff, and the degree to which LVCCLD has pioneered services and product integration.

Several key indicators support this position:

- LVCCLD has begun implementing RFID, patron self-check, and Automated Materials Handling (AMH) at a planned level as comprehensive and wide-ranging as any large urban library.
- LVCCLD has integrated patron payment of fines and fees into the self-service kiosks it has installed, using high-level secure financial protocols associated with online credit card payment.
- LVCCLD will, by early June 2009, have a centralized sorting system for handling the entire volume of materials that are transitted between LVCCLD's urban libraries.
- In addition, LVCCLD operates the full range of patron and staff-oriented technologies found in large urban library systems, including the following:
 - An integrated library system (ILS) with all related data management, patron catalog, materials purchasing, circulation and inventory control, and statistical and reporting features common to public libraries;
 - Public access PCs, including both Internet-connected devices and PCs supporting office-type software;
 - A PC reservation and print control system, supporting a range of patron services related to use of always-in-demand Internet PCs;
 - A wide variety of electronic databases and electronic and digital materials;
 - A commitment to World-Wide Web and Internet connectivity to LVCCLD's catalog, materials, and patron services, and from LVCCLD outward to the full range of digital library services available from commercial and other services via the Internet;
 - Wireless network access in all urban libraries for patrons with their own devices (laptop PCs, PDAs, etc.).

While LVCCLD has accomplished an enormous amount of development and created an enviable record of patron services, the organization has major challenges in front of it. This report will address those challenges.

Economic and Leadership Environment

This Technology Plan comes at a time of leadership change for the Library District, as a new Executive Director will arrive within 60 days of the Plan's delivery. Further, specific objectives enumerated in the Plan, or at least the timeline for completion for some objectives, may be influenced by the sobering realities of the current economic climate.

The author expects that the Plan will provide direction and identify opportunities for new leadership, but that the Plan will also be mutable and malleable, to permit new leadership to identify and pursue new service goals and to permit LVCCLD executive management and the Board to respond to emerging issues and circumstances.

The Plan does not stand on its own, but is connected to and subordinate to the Strategic Service Plan for 2008–2011. This Technology Plan identifies methods and strategies for achieving the service goals from the Strategic Service Plan.

Conducting the Project

The author of this Technology Plan spent three days in January 2009 in Las Vegas-Clark County Library District branches, observing operations, interviewing staff and some patrons, and reviewing materials and statistics provided by LVCCLD. The author also conducted a series of telephone interviews subsequent to the site visit, analyzed findings, and conducted product and pricing research.

Information Resources Used in Preparing the Technology Plan

The consultant's conclusions and analysis are based on review of documents, site visits to LVCCLD service locations and support centers, interviews with key staff, and on analytic and product research.

Documents and Other Materials Reviewed

- An earlier, draft, LVCCLD technology plan
- Houston Public Library Technology Plan, in draft form
- Ann Arbor District Library, Technology Component of Strategic Plan
- E-rate materials from the Schools and Libraries Program of the Universal Service and Administrative Company (SLP/USAC).

Service Locations and Facilities Visited

The consultant visited the following LVCCLD sites:

- Centennial Hills Library
- Enterprise Library
- West Las Vegas Library
- Spring Valley Library
- Clark County Library
- Las Vegas Library
- Library District Central Information Technology site at Clark County Library
- Automated sorting facility at Centennial Hills and West Las Vegas
- West Las Vegas presentation space
- Clark County Library presentation space.

Persons Interviewed

The consultant interviewed the following District personnel:

- Daniel Walters, Executive Director
- Robb Morss, Deputy Director
- Fred James, Chief Financial Officer
- Danielle Milam, Development Director
- Al Prendergast, Information Technology Director
- Ron Melnar, Assistant Information Technology Director
- Chris Britsch, Support Services Director
- Marie Cuglietta, Public Services Director
- Patricia Marvel, Marketing and Community Relations Director
- Jerilyn Gregory, Human Resources Director
- Frank Way, Production Tech Supervisor
- Lauren Stokes, Manager of Virtual Branch

Consultant's Reservations

This document is being prepared at a time when national unemployment is anticipated to exceed eight percent, with the Las Vegas metropolitan area being affected by the economic downturn, as much as the rest of the country. Despite the economic realities, this document recommends a number of labor- and capital- intensive investments that are not likely to be possible without substantial improvements in LVCCLD's revenue.

The interview with Fred James, Chief Financial Officer for LVCCLD, was sobering, in that his sources of financial information project at least a two-year period of depressed home values and thus depressed revenue from one of the District's primary funding sources. Despite the strong potential that finances may not be available to fund the recommended objectives in the time frames recommended, I am making the recommendations anyway, for these reasons:

- LVCCLD has technology challenges, as does any large public library system.
- Whether funded or not, the issues identified in this report will remain to be faced and solved, and having a document outlining the challenges will be useful for a shelf-life period of two or more years.
- The consultant and LVCCLD owe themselves, the staff, and patrons, an honest accounting of needed technology efforts.

Further, the impact of new technology implementation on the existing Information Technology staff has been and will continue to be a heavy burden. The IT staff is authorized to have a total of 14 Full-Time Equivalent (FTE) positions, but operates with 11 FTE at the time of this Plan.

The author has major reservations about projecting successful completion of complex technology projects without noting the understrength IT department that must be responsible for the successes or failures of such projects. As responsibilities grow and new technologies become available, so must the staff to implement and support grow in numbers and skills.

Technology Plan Needs Assessment

The report contains four major sections, each focusing on an area or type of technology used in LVCCLD. For each section, the report summarizes the current status of technology, followed by one or more goals related to enhancements or changes, and then recommended objectives. Each recommended objective has an associated timeline.

The time coverage for this Technology Plan is the three-year period between mid-2009 and mid-2012.

The four sections of the Technology Plan are summarized here.

1. *The Basics: Infrastructure and Items Related to E-Rate and LSTA Qualifications*

This section of the Technology Plan deals with the technology fabric common to every large public library. As a recipient of e-rate subsidies and LSTA grants, LVCCLD is required to develop a Technology Plan and make it available to the e-rate certification organizations (The Schools and Libraries Program of the Universal Services Administrative Company). This section will support LVCCLD's obligations regarding e-rate.

2. *The Big Initiative: Patron and Staff Services Investments*

This section deals with the current project to install RFID, AMH, and patron self-service features in each urban library, as well as plans for implementing a centralized automated sorting system.

3. *In Process: Maintenance and Support; Projects Underway*

This section deals with the support functions needed behind the scenes to maintain and upgrade current technology, implement new staff-oriented products and services, and migrate to a new technology support center.

4. *The Next Big Thing: Web 2.0, Digital Content, Presentation Space, and Broadcasting*

This section deals with the current and emerging environments associated with digital content, and with creating, archiving, editing, and delivering that content. In support of content creation and archiving, LVCCLD's presentation spaces (auditorium, concert hall, stages) will require investments outlined in this section.

1. The Basics: Infrastructure and Items Related to E-Rate and LSTA Qualifications

The LVCCLD basic infrastructure is common in form to virtually all multi-branch public libraries. This infrastructure includes the following elements:

- Local Area Networks and Wireless Access
- Wide Area Networks
- Workstations and Peripherals
- Servers
- Enterprise Software and Services
- Basic Voice Services (Telephony).

Applications Supported by Basic Technology

The infrastructure technologies identified in this section support all LVCCLD's primary public services:

- Books and materials access, via LVCCLD's Online Public Access Catalog (OPAC)
- Internet access, via public access PCs and wireless services
- Access to electronic databases
- PC reservation and print control services.

In addition, the same essential technologies support staff functions and operations associated with managing LVCCLD and its collections:

- Materials management (library materials purchasing, cataloging, and reporting)
- Inventory control (library circulation)
- A wide variety of administrative and facilities functions.

Current Status and Assessment

All LVCCLD libraries and all staff and public access PCs and related devices are cabled with Category 5E Ethernet cable, and Local Area Network traffic currently operates at 100 Mbps. All urban libraries operate some form of wireless LAN, with IEEE standard¹ 802.11a, b, and g wireless protocols. All Ethernet

¹ The Institute of Electrical and Electronic Engineers—IEEE—is the standards-promulgating body for Local Area Networks.

cables terminate in Category 5E punchdown blocks and switched Ethernet ports on a combination of Allied Telesyn and Cisco Ethernet switches. The Cisco equipment is LVCCLD's long-term choice, for its Quality of Service features discussed elsewhere in this plan.

All 12 urban libraries and the larger rural libraries have wireless services with limited in-building coverage, and LVCCLD Information Technology staff have plans underway to upgrade and replace the wireless services with the most recent standard, 802.11n (not fully IEEE-accredited but accepted by most vendors in a draft standard mode).

The 12 urban libraries are linked by Wide Area Network links that currently operate at 6 Mbps on Frame Relay Service (FRS) channels provided by Embarq (formerly Sprint). The 6 Mbps is a subset of Asynchronous Transfer Mode (ATM), and LVCCLD has plans to upgrade all the ATM over FRS to full 10 Mbps Ethernet, with some high-usage libraries getting 100 Mbps and the service center at Clark County Library getting 1,000 Mbps Ethernet.

The 11 rural libraries operate primarily on 1.5 Mbps T-1 links, operating on FRS channels that terminate at the Clark County Library's technology center. The exceptions are the Mount Charleston Library, which connects via a satellite link; the Meadows Library, which operates on a cable modem; and the Bunkerville Library, which connects via Digital Subscriber Line (DSL).

LVCCLD operates approximately 1,100 PC workstations, many with peripheral equipment, such as barcode scanners and receipt printers, connected. All PC equipment is Windows-based, using Intel-equipped PCs/devices. Workstations operate at least Windows XP and are being replaced with equipment that operates Windows Vista. Public-use PCs operate a range of software depending on their functional roles in the libraries, with Office software and Internet Explorer the predominant software products in use. Staff PCs operate a combination of Windows XP and Vista, with IT staff electing to transition on a gradual basis to Vista rather than converting all existing 1,100 workstations.

LVCCLD relies on two primary products that are enterprise software, that is, software products that the District and its patrons rely on for recurring and critical services. These products are the Millennium integrated library system provided by Innovative Interfaces, Inc. (III), and the LibOnline product, formerly provided by Telus, now controlled by Active Network.

Millennium Integrated Library System

The Millennium system is the single most critical software product that LVCCLD operates, providing these mission-critical service components:

- Circulation functions
- Public access catalog
- Cataloging
- Materials acquisitions

- Interfaces to variety of web-based services benefitting staff and patrons
- Reports and statistical functions
- Self-check client and RFID and AMH interfaces.

Interviews with staff operating and supporting the Millennium product are largely highly supportive of the product itself, although there is some concern about performance issues. Because of the central nature of the ILS to all enterprise computing within LVCCLD, performance of the ILS affects any processes interfacing with the ILS, such as PC reservation, self-check, e-commerce, and Automated Materials Handling.

The Millennium products include several additional features not currently installed within LVCCLD, including a public access enhancement named Encore that would provide patron reviews of materials, and a module for registering patrons for library programs.

In addition, a technical processing feature called Serials Control manages periodical publication orders and subscriptions, receipt of materials, and their presentation in the catalog. Use of the Serials Control feature would increase staff efficiency in ordering, receipt, and processing of periodical subscriptions. Further, this feature would allow periodical information to interface more fully with the public access catalog, improving patron access to serials publications and serials holdings information.

LibOnline

The other enterprise library services product is LibOnline, now owned and supported by Active Network. LibOnline provides these functions:

- PC reservation for public and Internet access workstations
- Printer selection and control
- Cost recovery and payment features for printing and other services
- Patron authentication for reservation and payment functions
- Reports and statistical functions.

The LibOnline product has been a useful but not entirely trouble-free addition to the LVCCLD environment. Among the issues LVCCLD has faced was the client software's absence of a Windows Vista version. Another issue is LibOnline's performance during the period at the turn of the hour, when most users start and stop their user sessions, and the recurring need to update patron authentication data by connecting to and receiving data from the Millennium system.

Telephone Services

LVCCLD operates voice services in a form familiar to many large urban libraries: a single NEC 2400 switch aggregates voice traffic at the network headend at Clark County Library, with a variety of service features installed in the switch and facilitated by the Local Exchange Carrier (LEC) Embarq.

These are the basic telephony features in use:

- Direct Inward Dialing (DID)
- Trunked outbound toll line to the Embarq switch
- 4-digit dialing
- 2-line handsets
- Voice mail
- Conference calling.

All urban service locations operate small NEC 2000 switches that are trunked to the LVCCLD headend at Clark County Library on leased point-to-point 1.544 Mbps T-1 circuits transmitting multiple voice channels. LVCCLD operates about 500 handsets in 24 locations, connecting handsets to the local NEC 2000 switches with a combination of Category 3 and Category 5E network cable.

A conversion to Voice over Internet Protocol (VoIP) is a potential major project for LVCCLD, but the IT staff believes VoIP is not yet ready for the Library District's requirements.

IT has tentative plans to replace the NEC equipment, probably in 2010, because the equipment is approaching end-of-life. The consultant supports LVCCLD's direction in telephony.

Performance Problems

The performance problems being experienced in the Millennium ILS may be at the center of one of LVCCLD's major technology challenges; both staff and patron workstations experience recurring and persistent response time problems. For example, staff Millennium log-ins may take several minutes to complete.

Information Technology staff are aware of the problem and have conducted what appears to be a thorough analysis of the problem. As with any complex technology environment, networks and workstations and servers and software are interconnected and what affects one set of components can cause problems throughout the interconnected network of devices.

Server Problem:

Primary suspected components are the server supporting the Millennium product and the design of the LAN and WAN networks. The server, a Sun Microsystems Sun Fire V880, is the original device acquired for the Millennium system in

2005, and may be causing some of the performance delays associated with LibOnline's connection and authentication problems. Technical analysis of its internal performance indicates both disk contention and input/output (IO) delays.

Flat Network Design:

The other likely suspected components are the design and capacity of both the Local and Wide Area Networks, which are "flat" networks without Quality of Service (QoS) features or packet-shaping features. One set of network channels transports all data for all devices in each LVCCLD location back to the server and network headend at the Clark County Library. Any data request occurring in a network channel contends with any other data request, so a patron that initiates a download of a music file, for example, has started a data transmission process that, until it concludes, will share the limited 6 Mbps channel with staff services sign-ons to Millennium, circulation transactions, Internet and web connections, and every other data request or transmission.

Redesign Active Directory:

The Local Area and Wide Area network components are not the only elements of LVCCLD's technology environment that require changes. LVCCLD operates Windows 2003 Server servers in a variety of roles and on many server devices, managing the District's Internet domain, handling file and printing services, acting as electronic mail hosts, and providing login services. To make the most effective use of a new multi-channel QoS-enabled network, LVCCLD will need to redesign the current LVCCLD Windows Active Directory features, originally implemented in 2001. The redesign should separate the public and staff systems and consolidate all the LVCCLD staff domains.

Configuring and operating a fully deployed Active Directory environment requires skilled staff with the time to devote to completing the Active Directory redesign. This issue grows in importance considering the current IT staffing levels.

Implement Quality of Service:

A Quality of Service implementation would effectively divide the networks into staff and public channels, dedicating some capacity to each. Coupled with a 60 percent or more growth in overall throughput, a more powerful Millennium ILS server, and redesigned Active Directory, LVCCLD's performance problems should diminish sharply.

Recommended Goals and Objectives

Goal 1: Improve Overall Network Performance

These are the objectives recommended for LVCCLD in regard to *Local Area Networks* and *wireless networks*:

Objective 1.1: Implement Quality of Service features as soon as possible, with all associated network hardware installations, Active Directory implementation, and domain division. Network and workstation performance and security will all benefit.

Objective 1.1 should be completed by early 2010. See also Objective 3.1, replace the Sun server.

Objective 1.2: Implement high-value wireless services at the current standard level, 802.11n as soon as is practical, using multi-channel NAPs to provide both an open public wireless connection and a secure staff connection. LVCCLD has identified Trapeze wireless products, including the Ringmaster series of Network Attachment Points (NAPs) as the preferred products for wireless services. This effort will be undertaken on a branch-by-branch basis, as staff and other resources are available.

Objective 1.2 should be completed by early 2010.

Objective 1.3: Complete the redesign and reconfiguration of Windows Active Directory features in the server environment.

Objective 1.3 should be completed by late 2009.

Objective 1.4: If demand for wireless services emerges for the smaller rural libraries, LVCCLD should provide services in those settings equivalent to those implemented in the urban libraries and the larger rural facilities such as Laughlin, Moapa, and Mesquite. LVCCLD provides several avenues for patron input and patron services requests, as well as staff input. At the time of this report, patron demand for wireless services in the unserved rural libraries has not emerged.

Objective 1.4 should be undertaken only when demand emerges, but the tasks associated with implementing new wireless features in a rural branch are capable of being completed within 45 days of initiation for any single branch.

These are the objectives recommended in regard to *Wide Area Networks*:

Objective 1.5: Implement enhanced 10 Mbps and 100 Mbps Ethernet channels as replacements for the 6 Mbps FRS/ATM and T-1 services now used. For high-usage libraries, upgrade to 100 Mbps channels, and for the technology hub at the Clark County Library, which functions as the LVCCLD network headend, upgrade to 1,000 Mbps. These are the upgrade plans for the urban WAN links and bandwidths identified in interviews with IT staff; they are on the LVCCLD workplan; they are sensible; and have the consultant's full support. The specific recommendation is to complete these upgrades in conjunction with Objectives 1.1 and 1.2 as soon as is practical.

Objective 1.5 should be completed by early 2010.

Objective 1.6: Providing increased bandwidth and capacity for the rural libraries is an entirely different matter. No demand for greater rural bandwidth exists, so there is no need to ask the primary Local Exchange Carrier (LEC), now called Embarq, to supply greater capacity. Embarq and other carriers cannot easily provide speeds beyond the current T-1 speed of 1.544 Mbps. What is important to note is that demand for greater speed is nearly non-existent, so LVCCLD is justified in leaving the current capacity as it exists. Device counts in the rural libraries are low, fewer than ten PC workstations per location, and staff and patron usage is also low. The exceptions are Moapa Library with 12 PCs, Laughlin with 33, and Mesquite with 12.

But as soon as demand appears, whether from staff or patrons, LVCCLD should move to upgrade the network capacities into appropriate rural libraries.

Objective 1.6, like Objective 1.4, should be undertaken only when demand or performance requirements emerge. The tasks associated with upgrading WAN links speeds to rural libraries are capable of being completed within 90 days of placing orders for capacity with Embarq, and other carriers, including XO Communications, Cox Communications, AT&T, Moapa Telephone, Reliance Connect, and Hughes NET.

Strategies for Achieving Objectives 1.1 through 1.6

LVCCLD has incorporated these objectives into its annual workplan and the IT and Facilities staff will acquire the needed network hardware, channel capacities from Embarq and other carriers, and any inside wiring and equipment installation that require contractor work. Following acquisition of required hardware, channel capacity, and inside wiring or equipment installation, the recommended strategies for achieving these goals are as follows:

- Begin with the Clark County Library as the network headend, and ensure a 1,000 Mbps capacity is in place before upgrading branch network channels.
- Focus on bringing up libraries as each receives its RFID, self-check, and AMH features, to ensure that LVCCLD meets added demand for network connectivity.

Workstations and Peripherals:

LVCCLD has an admirable plan for replacing its PC workstations on a recurring basis. LVCCLD's IT staff make use of LVCCLD's Microsoft open license and disk cloning technology for new PC deployments. At the time of this report, the District operates approximately 1,100 PC workstations with either Windows Vista or Windows XP as the operating system. All newly installed PCs will have Windows Vista installed.

LVCCLD's goal is to replace 20 percent of its workstations each year, or approximately 220 per year at the current rate. Such replacement is labor intensive, requiring configuring the equipment, setting parameters for operating system, network, security, and login, and then, in some instances, installing software. See Objective 2.1.

It is important to note that PCs have increasingly brief lifespans, as new features and new technologies work their way into personal computing. The rate of innovation and new feature development has not abated in the last 10 years, and there is no reason to expect a slowing of PC innovation. One result of new development is that PCs become obsolete more quickly.

Goal 2: Ensure Adequate and Up-to-Date Computers for Internet and OPAC Access

Objective 2.1: Continue to replace workstations at the current rate of 20 percent per year. Wherever possible, acquire equipment pre-configured for LVCCLD's parameters, to help reduce staff efforts.

Objective 2.1 is an ongoing operational requirement with no completion date. This objective is the same as objective 5.1, and is placed here for e-rate compliance.

Goal 3: Ensure Performance in Enterprise Software and Services

Objective 3.1: Replace the Sun server operating the III Millennium software as soon as is practical. The payoff in performance associated with completing Objective 3.1 and Objectives 1.1 and 1.5 will benefit all users connected to LVCCLD.

Objective 3.1 should be completed by September 2009.

Objective 3.2: Plan to install newly purchased products from III, including the Encore public access enhancements, Program Registration, and Serials Control. LVCCLD patrons will benefit from the enhanced public services, and there are efficiency values in using Serials Control to control order, receipt, and processing of periodical materials. In addition, the electronic versions of some serials can integrate more easily into catalog searches and displays.

Objective 3.2 is not time-critical, and can be undertaken in late 2010 for completion in mid-2011.

Objective 3.3: Implement Serials Solution as an adjunct to Objective 3.2. That is, make the web-enabled and electronic versions of serial publications as accessible and easily found as possible, and ensure that all the links between web citations and articles function smoothly.

Objective 3.3 should be conducted at the same time and in conjunction with Objective 3.2.

Objective 3.4: Consider replacement of LibOnline. Investigate the competitive offerings and compare LibOnline to other products. Active Network may not be investing in and supporting this product since acquiring it from Telus, and the Active Network website does not list LibOnline among the firm's current products.

Objective 3.4 should be conducted at the same time and in conjunction with Objectives 3.2 and 3.3.

Strategies for Achieving Objectives 3.1 through 3.4

LVCCLD will first acquire required hardware for Objective 3.1, then contract with the ILS software provider for expert assistance in installing and moving data from the old server to the new one. The software products identified in Objectives 3.2 and 3.3 will require coordination in staff training, vendor implementation, and any data loading or software configuration.

Costs for Achieving Section 1 Goals and Objectives

Table 1: Estimated Cost for Basic Infrastructure Upgrades and Enhancements, 2009–2012

Item	Description	Units	Unit Cost	Year One Cost	Annual Cost
1.	Purchase new Sun Server, Sun Fire ²	1	25,000	\$25,000	\$2,000
2.	Upgrade to 10/100/1000 WAN links ³	24	12,492	299,808	299,808
3.	Acquire new 802.11n wireless NAPs ⁴	72	1,250	90,000	11,250
4.	Acquire Cisco Catalyst switches ⁵	65	3,500	227,500	28,438
5.	Implement new III Millennium products ⁶	1	50,000	50,000	7,500
6.	Installation, wiring closet retrofit ⁷	12	5,000	60,000	0
7.	Professional services for III data migration	1	10,000	10,000	0
8.	Staff training and installing III software	1	10,000	10,000	0
9.	Staff training in Cisco and network operations	1	5,000	5,000	0
10.	Contingency @ 10 percent			77,731	34,900
Totals				\$855,039	\$383,896

² Cost estimate for a Sun Fire server with three years of maintenance costs included. Annual cost begins in year 4.

³ This is an average of 24 separate channel and connectivity charges, including both the urban and rural libraries. The actual cost-per-branch varies from a low of \$55.00 to a high of \$5,300. The anticipated charges for upgrading to the recommended 10/100/1000 Ethernet will actually be slightly lower than current WAN links.

⁴ This cost is based on an estimated average of 6 Trapeze Ringmaster NAPs per building. Actual count will vary depending on performance and wireless coverage.

⁵ Actual count will vary depending on number of PCs and networked devices located in each branch. This line item is based on a count of 1,100 PCs, plus printers, time clocks, HVAC controllers, and other devices connected to the network and the use of Cisco Catalyst 3750 switches with 24 ports each.

⁶ LVCCLD already has a license for Serials Control, but the Encore feature and Program Registration will be extra cost items.

⁷ Another estimated cost for outfitting branches for upgraded LAN equipment.

2. The Big Initiative: Patron and Staff Services Investments

LVCCLD has made major investments in patron and staff services related to the following cutting edge technologies:

- RFID
- Patron Self-Check and Self-Service, including payment of fines and fees
- Automated Materials Handling, both at branch and central sites.

The consultant believes that with the conclusion of the projects now underway, LVCCLD will be among the country's most wholly automated library in terms of patron self-service and in how library materials are handled for return and sorting.

This enviable record will require substantial additional effort, both in staff time and in costs for hardware, software, supplies, and services.

Current Status

At the time of this Plan's preparation, four of the twelve LVCCLD urban libraries—Centennial Hills, Enterprise, Rainbow, and West Las Vegas—have had these critical steps completed in the RFID/Patron Self-Service/AMH projects:

- All materials in these libraries have had RFID tags placed in them
- All these RFID tags have been programmed
- In-library furniture and service desks are installed and configured for patron self-check
- In-library installations are complete for patron self-check and Automated Materials Handling equipment
- Staff have been trained in supporting these products and services.

Work is underway to complete installations for the remaining eight urban libraries by the end of 2009, and the plan for installing the central sort facility in the portion of the Centennial Hills facility that is dedicated to LVCCLD central services is intended to begin in early April 2009 and be completed within 30 days.

By late 2010, virtually all circulation of materials within the 12 urban libraries will be conducted using the technology and policies embedded in this "big initiative" project, and all inter-branch movement of materials will take place using the central sorting system. That central sorting system will be installed, beginning in early April 2009, in the Centennial Hills Library's expansion area.

Staff and patron reaction to the self-service, RFID, and AMH features has been highly positive. Among the many benefits staff report are the following:

- Reduced staff effort in the check-out, check-in, and holds processes
- Reduced staff time in sorting materials, identifying items with holds, and getting those items on-shelf
- Improved patron service in holds processing
- High level of patron satisfaction in using the equipment and services
- Reduced patron waiting for circulation services.

Additional benefits will emerge when centralized sorting is moved from Centennial Hills to the new Southwest Library, which will also house all support staff and functions. LVCCLD Director of Support Services Christine Britsch pointed out the following opportunity during our interviews.

- Newly acquired and processed materials currently are boxed for delivery to the individual owning branches. These materials could go directly to the central sorting system. Approximately 25 percent of new items have holds on them, frequently for patrons not wanting to borrow from the item's owning branch, so new items upon arrival at their owning branch are directed back to a central facility for redirection to the patron location where the hold exists.
- As a result of processing staff using the central sorting system as a last step in their work, it is likely that more than 50,000 new items will be trapped annually immediately "out of the box" and directed to the branch where a hold exists for that item.
- The savings in staff time and the reduction in handling of materials will be substantial, and materials will arrive earlier for patron use. It is possible that 100,000 item transit trips could be avoided annually.

This scenario will be feasible when technical processing and central sorting are co-located in the administrative and support portion of the new Southwest Library, scheduled to open in April 2011.

Recommended Goals and Objectives

Goal 4: Complete RFID, AMH, and Patron Self-Service

The consultant's recommended objectives correspond with current LVCCLD plans. These objectives are all high-priority requirements.

Objective 4.1: Continue to tag materials and aim for early completion of the RFID tagging for all urban libraries.

Objective 4.1 should be completed by early September 2009.

Objective 4.2: Continue to implement patron self-service features in all the urban libraries.

Objective 4.2 should be completed by early September 2009.

Objective 4.3: Plan to install the RFID-enabled sorting systems in every urban library.

Objective 4.3 should be completed by late 2009.

Objective 4.4: Plan to implement the central sorting equipment and related staff features at the Centennial Hills location.

Objective 4.4 should be completed by mid-May 2009.

Objective 4.5: Plan to relocate the central sorting equipment and related staff features to the Southwest Library's central processing facility when construction is completed in 2011.

Objective 4.5 should be completed by mid-2011.

Objective 4.6: Implement the recommended automated sorting process of new materials, as soon as technical processing and central sorting are co-located in the Southwest Library, to ensure the best patron service possible and to reduce staff effort.

Objective 4.6 should be completed by mid-2011.

Costs for Achieving Section 2 Goals and Objectives

Table 2: Estimated Cost for LVCCLD Patron and Staff Services Investments

Item	Description	Units	Unit Cost	Year One Cost	Annual Cost
1.	RFID tags ⁸	3,000,000	\$0.40	\$1,200,000	60,000
2.	Staff RFID antennas, interfaces, software ⁹	90	3,500	315,000	37,800
3.	Patron self-service workstations	120	2,000	240,000	28,800
4.	AMH equipment, average cost per library	10	375,000	3,750,000	450,000
5.	AMH central sorting	1	920,000	920,000	110,400
6.	Security gates, extra bins, miscellaneous	1	450,000	450,000	54,000
7.	Vendor personnel costs: installation	1	500,000	500,000	0
8.	Training, staff travel, other	1	10,000	10,000	0
9.	Contingency @ 10 percent			738,500	73,850
Totals				\$8,123,500	\$814,850

⁸ The one-time costs are to complete current tagging, with annual costs going for new materials being added to the collection. LVCCLD applies one tag to books and two tags to media, with the mix of book and media being about 50 percent books and 50 percent media.

⁹ The costs shown are for devices LVCCLD will acquire, not those already in place.

3. In Process: Maintenance and Support; Projects Underway

This section of the Technology Plan deals primarily with items that are essentially not apparent to the public, in that the products and services described in this section are primarily intended to support staff use and operations, or they involve administrative and staff-oriented computing such as server virtualization, or they are part of maintenance efforts such as PC replacement.

The one exception is the LibOnline PC reservation and print control product. The discussion and recommendations for LibOnline are included in this section because they involve potential hardware and software replacement for a system already in use in LVCCLD.

Beyond that, while some of the items in this section are related to public services technology, the recommendations for this section are largely procedural rather than related to new development. That is, this section focuses more on maintenance and support of existing equipment and services than on implementing new technology.

PC Replacement

LVCCLD operates approximately 1,100 PC workstations and dozens more peripheral devices such as barcode scanners and printers. The Library District has a policy of replacing 20 percent of the PCs each year, or about 220, as well as adding other new equipment that is budgeted.

The consultant supports replacing fundamental equipment as part of a scheduled program and installing new equipment as planned. As noted elsewhere, PC replacement is a vital part of maintaining an up-to-date technology environment.

Server Virtualization and Support

LVCCLD operates approximately 95 servers—46 virtual and 49 physical servers—most housed in the technology center at the Clark County Library. The servers primarily operate the Windows Server 2003 operating system. The devices provide critical services, but operating a large number of servers can become a support and operations problem, for these reasons:

- Space required to house the servers is substantial
- Electrical draw can be expensive
- Using multiple physical servers means multiple hardware costs: one large device costs less than four smaller devices
- Heat generated can be difficult to manage, potentially requiring larger air conditioning

- Even with KVM (keyboard, video, mouse) switches permitting a few control and display peripherals to operate multiple servers, there's still a lot of equipment
- Operating system licenses for each server can become expensive
- Multiple cable runs to servers can create cable management problems.

With the multiple processing cores now common in servers, such as the Xeon CPU with four separate processors on a single chip, servers can operate server consolidation software products and provide service equivalent to separate devices but operating virtually. That is, multiple logical servers can operate on a single physical device.

LVCCLD's IT staff has begun the virtualization of their servers, using software products from a firm called VMWare. The consultant supports server virtualization, as a technique proven to save money, reduce staff effort, and make effective use of hardware and space.

Vocera Wireless Voice

LVCCLD would benefit from staff having access to effective mobile voice communication. In particular, as LVCCLD expands its patron self-services and AMH technology, public services staff will be located less behind a circulation desk and more often be in stacks, assisting patrons, conducting collection development tasks, or other work.

Being able to communicate quickly with mobile staff is a reasonable and achievable goal with wireless voice communications products such as Vocera. The system operates on the same wireless networks that LVCCLD will use for Internet access, but the small communication devices (badges as Vocera calls them) that mobile staff wear transmit voice in digital form.

LVCCLD has the Vocera implementation on its workplan, and the consultant supports implementing mobile wireless voice services.

PC Reservation and Print Control

As noted elsewhere in this report, LibOnline is an enterprise-level software product that supports very important public services tasks in LVCCLD. The firm that developed the product has sold LibOnline to another software firm, and the product appears to be languishing in its new home. At this time, LVCCLD shuts down the authentication processes at the "top of the hour" when most public PC sessions start and stop, and replaces the authenticated patron activity with a dummy or temporary patron login.

Part of the apparent LibOnline performance problems may be due to these two matters:

- Need to authenticate patrons against the Millennium patron database, which may be experiencing performance problems related to the Sun server.
- Network performance problems, likely related to bandwidth contention and absence of Quality of Service features.

Prior to making any decision regarding replacement of the LibOnline product, the consultant is recommending that Objectives 1.1, 1.5, and 3.1 be completed and tested. If performance for the LibOnline product continues to languish, then LVCCLD has two options:

- Replace LibOnline: This is likely to be difficult given the relative absence of good competing products; also, any such product will need to authenticate users from the ILS patron database, continuing to make significant demands on the ILS itself and on the data networks; *or—*
- If replacing LibOnline is unrealistic, LVCCLD's only other option would be to upgrade the server and other equipment supporting LibOnline with faster and more responsive devices.

Relocating the Information Technology Center

By April 2011, LVCCLD will have completed construction of its new Southwest Library, which will provide library services to the public while also consolidating into the Support Service Center staff functions now spread over three facilities. One key element of the consolidation will be moving the current Information Technology Center from its location at the Clark County Library to the Support Service Center.

This task will be demanding, requiring careful planning if LVCCLD is to maintain service at the same time that critical technology resources are being migrated.

These are the primary assets that will be relocated:

- Central servers for Millennium, email, web, and LibOnline
- Internet connectivity
- Wide Area Network (WAN) headend
- Main telephone switch.

LVCCLD will require contracted assistance to help make this move, including support from telecommunications carriers such as Embarq, software providers such as Innovative Interfaces, and server manufacturers and suppliers. Contracted staff will help by conducting some of the physical relocation and by reconfiguring equipment and software as part of the move.

Acquiring and Implementing a Room Scheduling Package

LVCCLD has a widespread mix of meeting rooms, presentation spaces, and public access facilities, as well as staff meeting rooms that it makes available to groups and for staff. Coordinating access to these facilities has been a demanding and not very rewarding process. The Library District needs to acquire a commercial software product to manage its public and staff-use meeting room facilities.

Recommended Goals and Objectives

Goal 5: Maintain PC Replacement Process

This objective is a high-priority requirement.

Objective 5.1: Install 220 replacement PCs per year.

Objective 5.1 does not have a termination date but will be ongoing. This is the same as Objective 2.1.

Goal 6: Complete Server Virtualization Process

This objective is a high-priority requirement.

Objective 6.1: Complete all server virtualization that is technically possible.

Objective 6.1 should be completed by the end of the year 2010.

Goal 7: Implement Vocera Wireless Voice Services

This objective is not a high-priority requirement, but should be undertaken over a two-year process, as 100 percent wireless coverage is achieved at each location.

Objective 7.1: Implement Vocera gradually, one urban library every 60 days, as IT staff are available.

Objective 7.1 should be completed by mid-2011.

Goal 8: Test LibOnline Performance After Server and Network Objectives are Complete

These objectives are high-priority requirements, but should be undertaken after tasks related to Objectives 1.1 through 1.5 are completed successfully.

Objective 8.1: Following the successful replacement of the Millennium server and the upgrade to the LANs and WAN links, evaluate LibOnline performance.

Objective 8.1 should be completed by mid-2010.

Objective 8.2: Based on the results of Objective 8.1, decide either to maintain LibOnline, upgrade its hardware bases, or replace it with another PC reservation and print control product.

Objective 8.2 should be completed by late 2010.

Goal 9: Relocate Information Technology Center with Least Disruption

This objective is a very high-priority requirement.

Objective 9.1: Following completion of the Southwest Library, relocate all central information technology resources from the Clark County Library to the Support Service Center in the new Southwest Library.

Objective 9.1 should be completed by mid-2011.

Goal 10: Improve Facilities Booking and Scheduling

This objective is not a high priority, and should be undertaken when the full range of facilities, including the new Southwest Library, can be incorporated into the booking and scheduling system.

Objective 10.1: Acquire and implement a meeting room booking and scheduling system.

Objective 10.1 should be completed by late 2011.

Costs for Achieving Section 3 Goals and Objectives

Table 3: Estimated Cost for New Technology Investments and Projects Under Way

Item	Description	Units	Unit Cost	Year One Cost	Annual Cost
1.	Acquire and install 220 PCs ¹⁰	220	\$1,500	\$330,000	\$330,000
2.	VMWare virtualization software	3	30,000	90,000	0
3.	Vocera badges	100	450	45,000	0
4.	Vocera basic software	1	24,800	24,800	2,976
5.	PC reservation & print control system ¹¹	1	150,000	150,000	18,000
6.	Professional services, relocate technology	1	60,000	60,000	0
7.	Meeting room booking and scheduling	1	20,000	20,000	2,400
8.	Miscellaneous expenses; travel, training	1	15,000	15,000	0
9.	Contingency @ 10 percent			73,480	35,338
Totals				\$808,280	\$388,714

¹⁰ The cost per unit is based on Dell Optiplex 760.

¹¹ Only if Objective 8.2 indicates a need to replace LibOnline. This is an estimated cost for a full replacement of LibOnline, based on its initial costs.

4. The Next Big Thing: Web 2.0, Digital Content, Presentation Space, and Broadcasting

This area of technology is important for LVCCLD in part because it represents virtually the last untouched area of library technology that LVCCLD has not yet exploited—in the best sense of that word. Area 4 also connects neatly with some of the patron empowerment and outreach features associated with the investments in Web services that LVCCLD has already made.

It is important to note that LVCCLD is engaged in a re-design of its World-Wide Web presence at the time of this report, and can and should take into account the recommendations regarding web presence and digital content as part of the re-design.

Web 2.0

Web 2.0 refers to the emerging use of the World-Wide Web as an outreach, educational, and social network. Web 2.0 has developed a high level of interest among young web enthusiasts, and the web user community places much emphasis on MySpace, Facebook, and other social networking sites.

Closely associated with Web 2.0, Digital Content, and Program Archives, to be discussed in this Plan, is the growing interest in small-scale broadcasting or Podcasting. These broadcasts generally have these characteristics:

- They are often local in nature, that is, intended to be distributed to an audience in a community
- They are intended to be captured on small portable devices or personal computers and played back on those devices
- They make use of Internet web and RSS (Really Simple Syndication), a method for distributing data on the Internet.

This Technology Plan focuses less on the distribution of Podcasts or small local broadcasting, and more on the processes of recording, editing, and archiving the content of programs themselves.

The author also cautions that LVCCLD will want to develop policy guidelines about the District's use of Web 2.0 features, to restrict those features to library services only. Web 2.0 is an open environment and, in an unrestricted mode, could potentially be exploited for non-library related purposes, creating more demand than returning value to LVCCLD patrons and staff.

Digital Content and Program Archives

Digital Content and Program Archives refers to providing, via the LVCCLD web presence, digital information content, as well as digitally recording LVCCLD's own programs and presentations. At this time, LVCCLD does not regularly

record or archive any programs, although on occasion some LVCCLD production staff for presentation spaces will use small personal video cameras to record programs, edit the programs on their personal home digital editing systems, and make the presentations available informally or through the LVCCLD web presence.

LVCCLD creates digital audio recordings of its Board meetings for distribution and archive purposes.

LVCCLD serves up a very large array of “eMedia” or commercially prepared digital content, which is the fastest-growing area of materials usage within LVCCLD.

Presentation Spaces and Controls

LVCCLD operates six presentation spaces, varying in audience seating from fewer than 200 to more than 400 seats. The presentation spaces are not all truly theaters, since some lack stage features such as overhead lighting and scenery drops. These are the spaces and their locations:

Concert Hall:	Whitney Library
Lecture Hall:	West Charleston Library
Auditorium:	Sunrise Library
Theaters (3):	Summerlin Library West Las Vegas Library Clark County Library

The spaces are in demand, for use by local theater groups, local civic groups, other departments or sections of Clark County government, and by LVCCLD itself, which has robust programming with offerings such as author talks. At this time, such programs are one-time/one-place programs. If a patron at West Las Vegas wishes to enjoy a program presented at Sahara West, he/she must travel to that program at the time the program is presented.

LVCCLD does not archive its programs, as noted elsewhere in this report, and does not regularly record in either audio or video formats the programs it sponsors or provides. LVCCLD does record some events, such as Board of Trustees meetings, and staff does make use of a portable video camera for recording certain events.

In general, though, the presentation spaces operate with technology that has these characteristics:

- Operates on analog methods (a style of equipment that is not computerized)
- Controls are generally 15 or more years old
- Lighting is appropriate for theatrical productions, with color spectrum frequencies around 2,000 to 3,000 Kelvin

- Internal sound and lighting control cabling in presentation spaces is point-to-point (not networked or multiplexed), capable of carrying analog signals only
- Control rooms or booths are not networked to the Internet or to other transport networks
- Video display features are absent or operate on small consumer-grade equipment.

It is important to note that the future Southwest Library will be outfitted with video, broadcast, and recording facilities. These features should be replicated and retrofitted into the existing presentation spaces in District libraries.

Broadcasting

That presentation space control rooms and control booths are not networked to any transport networks is important for several reasons:

- LVCCLD cannot transmit video of activities taking place in its presentation spaces, since those spaces lack video cameras and network connectivity. The absence of transmission features reinforces the “one-time, one-place” nature of LVCCLD programs taking place in the District’s presentation spaces.
- Presentation spaces cannot receive broadcasts either, so the presentation spaces cannot receive commercial or public broadcasting programs.¹²

Integration of Presentation Space with Virtual Library Services

As noted, LVCCLD’s presentation spaces do not operate effectively as recording locations. The Library District’s Virtual Library branch, tasked with the development and delivery of digital content, is a natural organizational location for undertaking upgrades to presentation spaces and to the capture, editing, and delivery of archived programs.

The interview with Lauren Stokes, Manager of the Virtual Branch, and a review of the grant request that LVCCLD has prepared for entry-level video capture and editing, as well as the interviews with Frank Way, LVCCLD’s Production Tech Supervisor, provide a natural lead-in to the following recommendations:

- Prepare for controlled Web 2.0 services at LVCCLD
- Upgrade the presentation spaces, including creating video-capable facilities
- Develop content editing capability
- Develop a digital content recording and archiving capability
- Link content to the Virtual Branch for delivery to patrons and staff.

¹² The Health Science Library at West Charleston is the exception, since a co-located nursing program has broadcast network connectivity to receive health science programs.

Recommended Goals and Objectives

Goal 11: Prepare for and Link to Web 2.0 Communities

Objective 11.1: Use Web 2.0 methods to link LVCCLD into the wide variety of web user communities. Develop controlled MySpace account and Facebook accounts for LVCCLD and publicize them for events, programs, and other purposes similar to LVCCLD's Homework Help and Teen Zone programs. Costs for such linkages are minimal.

Objective 11.1 should be completed by mid-2009.

Objective 11.2: Identify the Virtual Branch as the connecting point and host for Web 2.0 services. Costs for making Web 2.0 connected to the Virtual Branch will be minimal.

Objective 11.2 should be completed by mid-2009.

Goal 12: Upgrade Presentation Spaces to Make Them Video- and Broadcast-Ready

Objective 12.1: Make at least three of the presentation spaces—the theaters at West Las Vegas, Summerlin, and Clark County—video-friendly in the first year of a multi-year project. Include lighting that is Kelvin 3,200-capable for video recording; install upgraded digital theater controls and control booths; add one digital video camera per theater; and add large video display monitors in each theater. Costs for these objectives are speculative but expected to be very high. See Table 4 for estimated costs.

Objective 12.1 should be completed by late 2011.

Objective 12.2: Connect the presentation spaces to the Internet or to local networks to permit broadcasting programs in real-time to other locations in Las Vegas, including other LVCCLD libraries.

Objective 12.2 should be completed by late 2011.

Objective 12.3: Continue the efforts identified in Objectives 12.1 and 12.2 to make all six of the current facilities have the same resources as the to-be-built Southwest Library.

Objective 12.3 should be completed by late 2011.

Goal 13: Develop a Digital Content Editing Capability

Objective 13.1: Acquire digital editing hardware, software, and staff skills to create broadcast-quality content from the raw material recorded at LVCCLD events and programs, or otherwise recorded for LVCCLD as either the audience or the distributor for programs.

Objective 13.1 should be completed by late 2010.

Goal 14: Develop a Digital Content Recording and Archiving Capability

Objective 14.1: Begin to record all significant programs LVCCLD sponsors or hosts. As needed, develop release language or a service contract that permits not-competitive and non-commercial use for LVCCLD and its patrons of the content LVCCLD records.

Objective 14.1 should be completed by late 2010.

Objective 14.2: Archive, index, provide access to, and hotlink LVCCLD archived digital content. Lauren Stokes has identified a commercial service that will host digital content, alleviating LVCCLD of the burden of housing and serving up content.

Objective 14.2 should be completed by late 2010.

Goal 15: Brand LVCCLD's eMedia as the Virtual Branch and Focal Point for Digital Content

Objective 15.1: Bring all digital content—currently this is eMedia, including eBooks, NetLibrary, and Recorded Books—along with LVCCLD-created or LVCCLD-recorded content, into the newly branded Virtual Branch.

Objective 15.1 should be completed by late 2010.

Objective 15.2: Give the Virtual Branch a higher profile in LVCCLD's web presence, and begin to direct users seeking downloads, e-books, or other of LVCCLD's digital content, directly to the Virtual Branch.

Objective 15.2 should be completed by late 2010.

Costs for Achieving Section 4 Goals and Objectives

Table 4: Estimated Cost for Web 2.0, Digital Content, Presentation Space, and Broadcasting

Item	Description	Units	Unit Cost	Year One Cost	Annual Cost
1.	Make 3 theaters video and broadcast ready	3	\$400,000	\$1,200,000	\$240,000
2.	Acquire three professional video cameras	3	35,000	105,000	0
3.	Acquire and install video display monitors	3	30,000	90,000	0
4.	Acquire digital video editing capability	1	100,000	100,000	0
5.	Acquire digital video archiving and delivery	1	50,000	50,000	50,000
6.	Develop staff skills in video and editing	1	15,000	15,000	0
7.	Supplies, furnishings, miscellaneous	1	15,000	15,000	15,000
8.	Contingency @ 10 percent			157,500	30,500
Totals				\$1,732,500	\$335,500

For more detailed planning related to the LVCCLD presentation spaces, the Library District should engage a consultant with specific expertise in audio, video, and broadcast networking.

Findings and Recommendations: Summary Conclusions

This section concludes the LVCCLD Technology Plan by summarizing the following elements detailed in the Plan:

- A table of recommended objectives and a proposed schedule for achieving each objective
- A summary budget for the overall project, along with an estimated overall cost for the 3-year project period.

This section also includes two additional elements related to e-rate compliance and to good technology planning:

- Staff development requirements
- Evaluation requirements.

Proposed Objectives and a Schedule for Completing Them

Table 5: Schedule of Objectives

Objective	Brief Description	Start Quarter	End Quarter	Duration
1.1	Implement network Quality of Service	Q3, 2009	Q2, 2010	1 year
1.2	Implement 802.11n wireless	Q3, 2009	Q2, 2010	1 year
1.3	Complete redesign of Active Directory	Q2, 2009	Q4, 2009	6 months
1.4	Implement wireless in small rural libraries	As needed		
1.5	Implement 10/100/1000 Mbps Ethernet	Q3, 2009	Q2, 2010	9 months
1.6	Implement higher rural bandwidth	As needed		
2.1	Continue replacement of PCs	Ongoing		Ongoing
3.1	Replace Millennium Sun server	Q2, 2009	Q3, 2009	3 months
3.2	Install new Millennium features	Q4, 2010	Q3, 2011	9 months
3.3	Implement Serials Solutions	Q4, 2010	Q3, 2011	9 months
3.4	Evaluate replacement of LibOnline	Q4, 2010	Q3, 2011	9 months
4.1	Continue RFID tagging of materials	Ongoing	Q3, 2009	6 months
4.2	Continue to implement patron self-service	Ongoing	Q3, 2009	6 months
4.3	Install RFID-enabled AMH in urban libraries	Ongoing	Q4, 2009	9 months
4.4	Implement central sorting at Centennial Hills	Q2, 2009	Q2, 2009	45 days
4.5	Relocate central sorting to Southwest Library	Q2, 2011	Q3, 2011	30 days
4.6	Implement automated sorting of new materials	Q2, 2011	Q3, 2011	30 days
5.1	Install 220 replacement PCs per year	Ongoing		Ongoing
6.1	Complete server virtualization	Ongoing	Q4, 2010	18 months
7.1	Implement Vocera in urban libraries	Q2, 2010	Q2, 2011	1 year
8.1	Evaluate LibOnline performance	Q4, 2009	Q2, 2010	6 months
8.2	Upgrade or replace LibOnline	Q4, 2010	Q4, 2010	90 days
9.1	Relocate IT Center to new Southwest Library	Q3, 2011	Q3, 2011	30 days
10.1	Acquire, implement meeting room scheduling	Q3, 2011	Q4, 2011	90 days
11.1	Implement Web 2.0 features	Q2, 2009	Q3, 2009	90 days
11.2	Identify virtual branch as Web 2.0 center	Q2, 2009	Q3, 2009	90 days
12.1	Make 3 presentation spaces video friendly	Q3, 2010	Q4, 2011	15 months
12.2	Connect presentation spaces to networks	Q3, 2010	Q4, 2011	15 months
12.3	Make other presentation spaces video friendly	Q3, 2010	Q4, 2011	15 months
13.1	Acquire digital editing capabilities	Q4, 2009	Q4, 2010	1 year
14.1	Record LVCCLD significant programs	Q2, 2010	Q4, 2010	Ongoing
14.2	Archive and hotlink digital content	Q2, 2010	Q4, 2010	Ongoing
15.1	Bring all digital content into virtual branch	Q4, 2010	Q4, 2010	Ongoing
15.2	Give virtual branch higher profile	Q4, 2010	Q4, 2010	Ongoing

Summary Budget

In total, LVCCLD will need to make substantial additional investments in its technology to meet the goals and objectives detailed in this Plan. This section includes a table that summarizes the budget figures from the body of the Plan, in planning areas 1 through 4. The budget is tied directly to the five-year replacement cycle on which LVCCLD bases its hardware upgrade decisions.

Given that the estimated one-time and annual costs are for a three-year period, with variable start and end times for individual objectives, no single authoritative figure for costs emerges, but the probable cost estimate is approximately \$15,850,000. This cost figure is a mix of both capital and operating expenses.

The estimated cost is based on the full estimated Year One costs, plus 2.25 as the multiplier for the Annual Costs. This multiplier is a rule-of-thumb the author uses for estimating future costs and takes into account warranty periods in which no annual recurring costs are charged.

Table 6: Summary Estimated Costs for the Technology Plan, 2009–2012

Item	Description	Year One Costs	Annual Cost
1.	Section 1 cost totals: Infrastructure	\$855,039	383,896
2.	Section 2 cost totals: The big initiative	8,123,500	814,850
3.	Section 3 cost totals: In process	808,280	388,714
4.	Section 4 cost totals: Presentation	1,732,500	335,500
Totals		\$11,519,319	\$1,922,960

Staff Development and User Education Requirements Related to The Technology Plan

LVCCLD will benefit from a comprehensive staff training and public user education program. While the District has many of the basic requirements in place, the following recommended points will reinforce the skills development needed to make technology implementations successful.

The following points are not objectives in the sense of the formal technology plan recommendations, but instead are “best practices” recommendations.

- LVCCLD should ensure adequate staff skills associated with implementing new products and services by contracting with suppliers for specialized training. EnvisionWare and Innovative Interfaces, Inc. (III) both have training courses that LVCCLD staff will take advantage of. For example, III can provide on-site training programs at LVCCLD for staff as well as training materials for LVCCLD’s own staff trainers.
- LVCCLD should ensure adequate staff time for successful completion of work by acquiring as many products and services pre-configured and pre-loaded as possible, to reduce staff effort in implementing those products. For example, have Innovative Interfaces receive the Sun server identified in

Objective 3.1 and pre-load Millennium software and LVCCLD configurations, prior to supplying the equipment to LVCCLD.

- LVCCLD should ensure some staff release time to read manuals and best practices documents, and to test their skills in using new technology.
- Whenever possible, employ web-based training services for their lower costs, higher availability, and ease of use. Such programs are often repeatable, available to a variety of staff simultaneously or on demand, and may be available over extended periods of time on a subscription basis. At least two potential vendors of such services are active in this market.
 - SkillSoft: see <http://www.skillsoft.com/Catalog/default.asp>
 - Serebra: see <http://www.serebra.com/e-learning/default.htm>
- LVCCLD should support staff certifications wherever such technical and professional certificates apply. Cisco Systems and Microsoft both have comprehensive training and certification courses. In addition to release time, LVCCLD should provide funding for certification training.
- In addition to web-based or online training courses, a variety of commercial training firms make courses available at their own facilities. Commercial training organizations such as New Horizons (see <http://www.newhorizons.com/content/index.aspx>) are often accredited by firms such as Microsoft and Cisco and can provide highly regarded training.
- LVCCLD should consider creating a set of training courses for those job requirements for which no external training exists. As the District's implementation of RFID, AMH, and patron self-service features expands, having in-house training services could ensure that operations and support staff have all received a common set of operations principles and methods. This in-house training program could be part of a set of courses that include vendor-supplied and in-house developed training.
- LVCCLD could exploit its technology base in PC workstations and computer access facilities (computer labs) to continue its programs in educating patrons as users. Focus on practical topics for patrons, including use of software available on LVCCLD public access computers, and use of LVCCLD services such as the Millennium system and self-service products.

Evaluation Requirements

To measure the effectiveness of its technology strategies and investments, LVCCLD will conduct these evaluation activities subsequent to implementing the technologies identified in this Plan. The evaluation requirements shown will apply to every element of the Plan.

LVCCLD will update the Plan annually, to show what has been accomplished, and what remains to be completed. Staff will conduct annual updates, to measure the following attributes:

- Have objectives detailed in the Plan been accomplished, and if so, how completely?
- Which elements in the Plan have not been accomplished?

To measure success, LVCCLD will make use of these evaluation tools:

- Examine actual implementation of new or replacement technology by comparing quarterly goals with staff and vendor activities in installing and configuring new products and services.
- Test response time for a variety of staff and patron activities, to ensure that the investment made in a new server and new network features operate correctly and provide quicker responses.
- Test and compare patron and staff usage of the new wireless network access points, to ensure that they operate as required, with the throughput, security, and building coverage for access.
- Compare statistical and usage figures for RFID and AMH activities to identify how successful the implementation of these technologies has been.
- Identify objectives that have been met and can thus be “checked off” the list of targets. In addition, identify objectives that are no longer relevant and remove them from the Technology Plan.
- Identify any goals and objectives of the Technology Plan that have not been met. Why are they unmet? Are there ways to overcome these barriers?
- Create a plan for meeting unmet goals and objectives.
- Identify any additional needs that have emerged since the most recent plan.