



SHARING A FEDERAL PRINT REPOSITORY: ISSUES AND OPPORTUNITIES

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PREFACE

This report is an evaluation of the issues federal libraries would need to consider should they enter into a cooperative agreement for shared off-site storage of print collections. Based on interviews by the researchers of this report that were conducted with select academic and research library consortia, the report summarizes the organization and operations of these consortia. The researchers sent a survey to approximately 60 federal libraries to ascertain potential interest in forming a consortium, and the results of this survey are summarized herein. Also discussed are the requirements for constructing a storage facility that is compliant with National Archives and Records Administration (NARA) regulations, and the specifications of facilities currently operated by NARA that could potentially house large print collections.

This report also reviews Library of Congress procedures for book preservation and copy selection in conjunction with archival storage. This process includes copyright considerations, cataloging tools for identifying redundancies, and the role of digital repositories. The report concludes with suggested topics for further discussion of the above issues.

On May 25, 2011 the Federal Library and Information Committee (FLICC) convened a forum of federal libraries to review the issues raised in this report. In response to the request of several attendees at that meeting, the Federal Research Division (FRD) re-surveyed the federal library community to ascertain potential interest in forming a consortium. The results of that second survey are contained in this revised report. In addition, FRD distributed the May 2011 report to the persons named below, and in this revised report have incorporated comments received from several recipients.

The authors of this report gratefully acknowledge the many people who graciously gave of their time and shared their knowledge of the topics covered herein. This report would not have been complete without their input. In alphabetical order, they are:

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INTRODUCTION

Federal, academic, and research librarians today face two issues regarding their ever-growing print and journal collections—how to best manage the collection and how to preserve its contents. The dual objectives of collection management and preservation have been partially met by the digitization of print materials. In 2000 Congress recognized the importance of collecting and preserving high-value digital content by enacting legislation directing the Library of Congress to establish the National Digital Information Infrastructure and Preservation Program (NDIIP) and to develop an implementation strategy for collection and preservation.¹ The Library was mandated to develop, together with federal entities with expertise in telecommunications technology and electronic commerce policy, an implementation plan that would include the identification of “a national network of libraries and other organizations with responsibilities for collecting digital materials that will provide access to and maintain these materials.” The Library was also directed to work with the U.S. Copyright Office to include in its implementation plan “the policies, protocols, and strategies for the long-term preservation of [digital] materials.”²

However, there is an inherent value to artifact materials, and, as Schonfeld and Housewright note in their 2009 study of print journal collections and digitization, there are several rationales for retaining “last” copies of print materials:

the need to fix scanning errors; insufficient reliability of the digital provider; inadequate preservation of the digitized versions; and the presence of significant quantities of important non-textual material that may be poorly represented in digital form.³

They caution that although policies within and among research libraries may be in place regarding the disposal of last copies, “there is a very real risk that so many copies may be discarded as to threaten the availability of certain materials in their original format.”⁴

Recognizing the need to adopt a coordinated approach to archiving and storing print materials, many academic and research libraries whose current facilities are inadequate to

¹ Library of Congress, “Preserving Our Digital Heritage: The National Digital Information Infrastructure and Preservation Program 2010 Report,” March 2011, 9, http://www.digitalpreservation.gov/library/resources/pubs/docs/NDIIP2010Report_Post.pdf (accessed April 4, 2011); H.R. Rep. No. 106-1033, at 610 (2000) (Conf.Rep).

² H.R. Rep. No. 106-1033, at 611 (2000) (Conf.Rep).

³ Roger Schonfeld and Ross Housewright, “What to Withdraw? Print Collections Management in the Wake of Digitization” (Ithaka S+R, September 29, 2009), 2, <http://ithaka.org/ithaka-s-r/research/what-to-withdraw> (accessed March 4, 2011).

⁴ Schonfeld and Housewright, 8.

properly house their collections have entered into cooperative agreements with similar institutions. Together, these institutions have formed regional consortia to store print collections in shared off-site facilities. Most of these storage facilities follow the design standard developed by Harvard University in 1986 (now known as the Harvard model); they contain high-density stacks, have the capacity to store several million volumes, and sort the collection by volume size rather than by subject or call number. In addition, as Lizanne Payne, former director of the Washington Research Library Consortium, noted in her 2004 study of models of library storage, “the *sine qua non* of library depositories [is] maintaining low temperature and relative humidity levels [generally 50° and 35 percent, respectively] to promote long-term preservation of paper materials.”⁵ As of 2007, at least 68 high-density storage facilities existed, but only 14 of these facilities were cooperative.⁶ This report summarizes interviews conducted by its researchers with the directors of the Harvard Depository and with the directors of several regional consortia that use the Harvard model but vary in their organizational paradigms. The Library of Congress off-site storage facility at Fort Meade, Maryland, houses more than 3 million volumes in four environmentally controlled storage modules and has the capacity for nine additional modules. This report reviews the structural specifications of the modules and the operations and inventory-control systems of the facility generally. The operations of the Yale University Storage Facility are discussed as an example of an institution that has opted to “go it alone” rather than join a cooperative venture.

Federal librarians have faced the challenge of inadequate storage space for their collections for decades, and although predictions were made many years ago that shared off-site storage facilities for federal library print collections would be constructed, none exist today. In an effort to assess the current storage needs of federal libraries and to ascertain potential interest in a cooperative agreement with the Library of Congress, the researchers of this report surveyed more than 50 federal libraries and summarize herein the responses received. The team also evaluated storage facilities operated by NARA that could potentially house large print

⁵ Lizanne Payne, “Depositories and Repositories: Changing Models of Library Storage in the USA,” *Library Management* 26, no. 1/2 (2005): 11, <http://www.emeraldinsight.com/0143-5124.htm> (accessed March 7, 2011).

⁶ Lizanne Payne, “Library Storage Facilities and the Future of Print Collections in North America” (report commissioned by OCLC Programs and Research, October 2007), 6, <http://www.oclc.org/programs/publications/reports/2007-01.pdf> (accessed March 4, 2011). Ms. Payne noted in a February 2011 Webinar that 80+ storage facilities were in existence but advised the authors in e-mail correspondence March 23, 2011, that “no one is keeping definitive statistics” about the numbers of storage facilities.

collections, and this report discusses the regulatory facility requirements for all storage facilities. A table stipulating “minimum security standards for Level III federal facilities,” published in the *Code of Federal Regulations*, is included in Appendix 1 of this report.

According to Lizanne Payne, one of the many issues that a consortium would be required to decide in its formative stage is whether the off-site facility would be a shared storage facility, or a storage-based archive.⁷ If a shared storage facility is chosen, the member institutions would send print materials from their collections, based on any selection criteria, but not commit to retain those materials for any specified time. If the member institutions opt to form a storage-based archive, the single most important defining issue would be a commitment to retain stored collection items for a specific time period. The members would agree to the terms of access to the collection, as well as delivery services that would be provided. The collection would be retained in an environmentally controlled facility for the use of future generations. WRLC in Upper Marlboro, Maryland, and the Five Colleges Library Consortium in Amherst, Massachusetts, are examples of this type of facility.

The Library of Congress and other academic and research libraries have established criteria for the selection of materials for archiving, including subject content, patron usage, format, digital availability, and requirements of U.S. copyright law. Many of these criteria could be adapted to a consortium collection. In addition, member institutions of a consortium would be required to evaluate their respective collections in order to identify redundant items. Although OCLC’s WorldCat is currently North America’s principal “union catalog,” listing the collections of numerous libraries, it may not be a sufficiently comprehensive tool for identifying duplicate items, because libraries independently create the holdings data. This report discusses other approaches for collection analysis that may be applicable to a federal library consortium.

As noted earlier, digitization of print materials is widely used as a means of both collection management and preservation. According to a 2010 study on the cost of storing and using print materials, the number of “reliable electronic copies of works [that research libraries hold] is increasing by tens of thousands a week.” The authors conclude that this preponderance of digital material strengthens the argument for research libraries to share a good deal of both

⁷ Telephone interview with Lizanne Payne, April 22, 2011.

digital and print collections.⁸ Digital repositories such as the HathiTrust and Internet Archive have been developed to house materials both created in electronic format and originally created in a physical format and later converted into electronic format. The use of digital repositories to relieve overcrowding of print collections and manage the selection of materials for off-site storage is reviewed in this report.

OFF-SITE LIBRARY STORAGE FACILITIES: SELECT MODELS

For the dual purposes of collection management and long-term preservation of print materials, many academic and research libraries share off-site storage facilities as members of regional consortia. The high-density storage facilities that they have constructed fall into two categories: the Harvard model and automated storage and retrieval systems (ASRS). In a Harvard-style facility, books are retrieved manually from cardboard boxes by operators using mechanical order-pickers. Then they are delivered by courier from an off-site location. In an ASRS facility, they are retrieved from metal bins by robotic crane.⁹ The primary advantage to the ASRS approach is that retrieval is much more rapid, but this system only makes sense if the storage facility is located adjacent to the single library being served, so that the items retrieved by robot can be delivered within minutes to the waiting customer. A related advantage is that, given rapid retrieval, the items stored do not necessarily have to be low-use. Disadvantages are the higher cost of construction and the fact that such an approach does not lend itself to shared archives located at a distance from the member libraries.

The researchers decided not to examine ASRS facilities in detail because the goal was to explore options for shared storage of low-use material. Therefore, they turned their attention to the Harvard approach and attempted to focus on a sample of facilities representing different organizational paradigms. They conducted interviews with the directors of the following facilities:

- Harvard Depository in Southborough, Massachusetts
- Research Collections and Preservation Consortium (ReCAP) in Princeton, New Jersey
- Washington Research Library Consortium (WRLC) in Upper Marlboro, Maryland
- Five College Library Consortium (FCLC) in Amherst, Massachusetts

⁸ Paul N. Courant and Matthew Nielsen, “On the Cost of Keeping a Book,” in *The Idea of Order: Transforming Research Collections for 21st Century Scholarship* (Washington, DC: Council on Library and Information Resources, June 2010), 82, <http://www.clir.org/pubs/reports/pub147/pub147.pdf> (accessed March 22, 2011).

⁹ Payne, “Library Storage Facilities and the Future of Print Collections in North America” 9.

- Western Regional Storage Trust (WEST), based at various sites in the western United States
- Yale University Storage Facility (YUSF) in New Haven, Connecticut

To put the above list in perspective, in 2007 Lizanne Payne, a consultant for the Center for Research Libraries, compiled the following chart of Harvard-style library storage facilities in North America (see Table 1).

Table 1. Harvard-Model Library Storage Facilities in North America

Harvard-Model Facilities (or Modified Harvard-Model)	Ownership	Year Opened	Current Capacity*	Current Volumes
Harvard University	Individual	1986	16,000,000	6,300,000
University of Michigan	Individual	1992	2,100,000	2,100,000
University of Texas, Austin	Individual	1992	1,600,000	1,200,000
Northeastern Ohio Cooperative Regional Library Depository	Shared	1994	1,175,000	1,175,000
Southwest Ohio Regional Depository	Shared	1994	2,000,000	1,999,000
Washington Research Library Consortium	Shared	1994	1,500,000	1,100,000
Ohio State University	Individual	1995	2,400,000	2,400,000
Northwest Ohio Regional Book Depository	Shared	1996	1,800,000	1,200,000
University of Missouri	Shared	1997	1,300,000	1,250,000
University of Virginia	Individual	1997	750,000	735,000
Cornell University	Individual	1998	4,100,000	3,200,000
University of Pennsylvania	Individual	1998	2,000,000	1,200,000
University of South Carolina	Individual	1998	1,500,000	900,000
Yale University	Individual	1998	3,000,000	2,000,000
Minnesota Library Access Center	Shared	2000	1,400,000	1,100,000
Research Collections and Preservation Consortium (ReCAP)	Shared	2000	7,000,000	5,950,000
West Virginia University	Individual	2000	1,000,000	1,000,000
Duke University	Individual	2001	3,000,000	2,000,000

Harvard-Model Facilities (or Modified Harvard-Model)	Ownership	Year Opened	Current Capacity*	Current Volumes
Five Colleges (Massachusetts)	Shared	2001	500,000	320,000
Johns Hopkins University	Individual	2001	2,400,000	1,000,000
PASCAL (Colorado Academic Libraries)	Shared	2001	1,600,000	1,000,000
Library of Congress	Individual	2002	3,800,000	2,200,000
University of Pittsburgh	Individual	2002	2,500,000	1,300,000
Arizona State	Individual	2003	1,700,000	1,100,000
Indiana University, Bloomington	Individual	2003	2,800,000	1,400,000
Rice University	Individual	2003	1,750,000	625,000
Stanford University	Individual	2003	3,000,000	1,200,000
University of Illinois, Urbana-Champaign	Individual	2004	2,000,000	2,000,000
University of Western Ontario	Individual	2004	1,600,000	300,000
University of Nebraska, Lincoln	Individual	2005	800,000	400,000
University of Texas, Arlington	Individual	2006	500,000	300,000
University of Toronto	Individual	2006	2,000,000	200,000
Total			80,575,000	50,054,000

* Capacity measured in "volume equivalents"; i.e., space required for an average monographic volume. Archival boxes (equivalent in size to 20 volumes), which occupy a notable share of available capacity in most facilities, are not reflected in these figures. Available storage space may therefore be significantly less than the difference between Current Capacity and Current Volumes.

Source: Payne, "Library Storage Facilities and the Future of Print Collections in North America," 12.

Harvard Depository¹⁰

The Harvard Depository, established in 1986, pioneered the Harvard high-density storage model, which has been widely adopted by other storage facilities.¹¹ Updating the figures in Table 1, the Harvard Depository has a current capacity of about 10 million items and about 8.5 million items in storage, according to Matthew Sheehy, Assistant Director of the Harvard University Library. The facility, which is located in Southborough, Massachusetts, approximately 26 miles

¹⁰ Information in this section was provided by Matthew Sheehy, Assistant Director of the Harvard University Library for the Harvard Depository, Southborough, MA, in a telephone interview, March 30, 2011 and email correspondence on June 13, 2011.

from the Harvard University campus, initially outsourced its services to Iron Mountain but in January 1991 decided to move services in-house, hiring some of the Iron Mountain personnel in the process. The primary reason for the change was to decrease overhead costs and avoid reporting requirements associated with the facility's corporate structure. The change resulted in greater autonomy. The Massachusetts Institute of Technology (MIT), which shares borrowing privileges with Harvard, has been the Depository's main external customer since 1986. Currently, the Depository serves approximately 540 customers, 30 of which are external. External customers, in addition to MIT, include the Massachusetts Historical Society, Brandeis University, and Simmons College.

In February 2011, the Harvard University Library announced plans with MIT to explore the formation of an alliance, one initiative of which would be the creation of joint off-site storage facilities.¹² If this initiative is implemented, it will be viewed as a "true shared facility" and will entail the elimination of duplicates. Harvard is evaluating the Five Colleges Library Depository and ReCAP as possible models. Matthew Sheehy favors a collaborative model because currently the facility is spending increasing amounts of money on less valuable material. A true shared storage facility would also enable Harvard to have more control over what items member institutions are permitted to submit.

The Depository is a multipurpose facility that includes "dark archives," primarily for JSTOR but also other special collections and university archives, such as presidents' papers. It also maintains gray archives, which are operationally different from the regular collection. The Depository maintains cold vaults as well, which provide extra security for special collections and rare books, including environmental controls—40° F and relative humidity of 35 percent (compared to 50° F and a relative humidity of 35 percent for the remainder of the collection). Currently, the Depository processes 220,000 requests per year. Ninety-seven percent of the collection does not circulate, and 10 percent of pulled items circulate for only one day.

¹¹ "Harvard Depository," Harvard University Library, 2011, <http://hul.harvard.edu/hd/pages/facility.html> (accessed March 30, 2011).

¹² "Harvard and MIT Libraries Explore Far-Reaching Alliance," Harvard University Library, February 4, 2011, http://hul.harvard.edu/news/2011_0204.html (accessed March 25, 2011).

Research Collections and Preservation Consortium (ReCAP)¹³

In 2000 Columbia University, Princeton University, and the New York Public Library (NYPL) officially established the Research Collections and Preservation Consortium (ReCAP) and opened its shared storage facility in 2002.¹⁴ Updating an estimate in Table 1, ReCAP's current capacity is 8.5 million volumes, according to Eileen Henthorne, Executive Director of ReCAP. ReCAP limits membership to research libraries. Despite requests from several libraries, including one large research library and even corporate entities, all requests have been rejected because of space concerns.

In order to establish itself, the consortium purchased land from Princeton University on the Forrestal campus in Princeton, New Jersey, and drafted contracts to allocate space and to become incorporated (see Figure 1). The consortium has yet to experience any problems with governance, likely because it has held regular biweekly meetings during construction and continued these meetings until the facility was in full operation.

¹³ Information in this section was provided by Eileen Henthorne, Executive Director, ReCAP, Princeton, in telephone interviews, March 10 and April 19, 2011, and e-mail correspondence, April 29, 2011 and June 13, 2011.

¹⁴ "ReCAP—The Research Collections and Preservation Consortium," Princeton University, 2011, <http://recap.princeton.edu> (accessed March 3, 2011).



Figure 1: Research Collections and Preservation Consortium—ReCAP (in Princeton, NJ)

Source: Jennifer Caterino, “Green Industrial—Warehouses and factories wouldn’t seem to lend themselves to sustainable design, but attitudes—and practices—are changing,” *Architect Magazine*, December 30, 2010, Ross/Taylor Photo, <http://www.architectmagazine.com/industrial-projects/green-industrial.aspx> (accessed April 6, 2011).

At a cost of \$25 million, shared equally among the members, ReCAP purchased land from Princeton and built a new facility that included the first three storage modules and office space. In order to determine what sort of arrangement and facility should house the collections, two people from each institution formed a library operating group, which toured and inspected various facilities around the country. Ultimately, ReCAP decided to build its facility from scratch, unlike John Hopkins and the University of Pennsylvania, which had tried to retrofit existing buildings but eventually were required to build new facilities. ReCAP did experience some cost overruns in the process of building the facility because of unforeseen problems. Princeton Township intervened after having approved all the design plans and required that ReCAP alter the fire-suppression system at a cost of \$100,000. Additionally, some shelving needed to be reconfigured at an additional cost of \$1 million.

ReCAP has since built two additional modules and has plans in place to build two more modules in the near future, for a total of seven. The consortium hired the consultant who designed the Harvard Depository to plan the first three modules. However, this arrangement was

not entirely successful, primarily because he was unwilling to adapt the Harvard model to a different set of collections. ReCAP no longer employs consultants and does all collections analysis and planning in-house, which it reports has worked well.

The consortium did encounter some implementation problems, likely because it was not an outgrowth of an existing consortium; rather, it was formed specifically to share storage space. As a result, it did not have a shared catalog, and, moreover, the three libraries had incompatible barcode systems (and NYPL did not even use a barcode system). The consortium adopted and continues to use Generation Fifth Applications' (GFA) Library Archival System (LAS) to combine the three catalogues, although LAS was unable initially to recognize the different barcode systems. Nor was GFA set up to handle the volume that the CAP expected to process in the first years of operation. The library operation group worked with GFA prior to opening the facility to recognize the different barcodes and to make other changes within LAS to support the three partners.

ReCAP has not changed its policy regarding duplicate materials, although this position is being reconsidered subject to grant funding. Initially, the consortium chose not to remove duplicate items from the collections as they came into storage. ReCAP's management has some regrets that a so-called de-duping process was not the policy from the outset, but regards removing duplicates retrospectively as expensive and time-consuming.

Washington Research Library Consortium (WRLC)¹⁵

Eight Washington, DC–area universities¹⁶ established the Washington Research Library Consortium in 1987 as an independent 501(c)(3) nonprofit organization.¹⁷ Its board of directors, consisting of the provost and chief financial officers (CFOs) of each member institution, has fiduciary responsibility for the organization. The WRLC Library Directors Council formulates initiatives for the consortium, which are then implemented by the Steering Committee. Additionally, a Preservation Committee, composed of members from each university, oversees environmental issues, including temperature and humidity settings. For example, WRLC has set

¹⁵ Information in this section was provided by Mark Jacobs, Executive Director, and Bruce Hulse, Director of Library Services, WRLC, in a site visit by the researchers, March 15, 2011.

¹⁶ American University, Catholic University, Gallaudet University, George Mason University, Georgetown University, George Washington University, Marymount University, and the University of the District of Columbia.

¹⁷ "About WRLC," Washington Research Library Consortium, 2011, <http://www.wrlc.org/> (accessed March 2, 2011).

its temperature and humidity at 60° F and 40 percent relative humidity, which represents a compromise environmental control between what the Preservation Committee deemed ideal and what the facility is capable of maintaining (see Figure 2).



Figure 2: Washington Research Library Consortium (in Upper Marlboro, MD)

Source: Photo by Seth Elan

In the 25 years that member institutions have worked together, the consortium has experienced much more harmony than conflict. Tension has occurred around the issue of money, e.g., an institution balking at paying for space it would never have the need to use. However, these instances have been addressed and resolved in a manner acceptable to all members. In planning their storage facility, WRLC benefited from a preexisting common catalog (ALADIN), which preempted the need to make a special investment in new software.

WRLC built the first module of its facility on donated land in Upper Marlboro, Maryland, using funds from a grant acquired through the Department of Education. Capital investment from member institutions became necessary only when the second module was designed and constructed. Member institutions contribute funds in proportion to the space reserved for them at

the storage facility. For example, George Washington University and Georgetown University contribute 37 percent and 32 percent, respectively, and retain that percentage of shelf space.

WRLC's first module, which stores 1.5 million items in 12,000 square feet of space, is full; the second module has the same area and is 25 percent full. The consortium has begun planning for a third module. The facility has sufficient land for a third module, but another plan for a new facility at George Washington University's Loudon campus in Virginia is also under consideration. As a result, no decision has yet been made regarding future construction.

WRLC maintains three types of materials—circulating materials (monographs), materials for library use (bound periodicals), and materials with restricted use (rare items and manuscripts). The consortium has adopted the policy of retaining two copies of every monograph and one copy of bound periodicals, many of which are available online. WRLC shreds extra copies of materials and to date has shredded approximately 40,000 volumes. However, remarkably little overlap exists in the collections of the member libraries, as reflected in their shared catalog. Redundancy occurs in about 11 percent of periodical titles and 7 percent of monographs. The entire collection of the member institutions numbers approximately 7 million volumes.

Five College Library Consortium (FCLC)¹⁸

FCLC is a natural outgrowth of Five Colleges, Inc., a nonprofit educational consortium established in 1965 that allows students at the University of Massachusetts-Amherst, Amherst College, Smith College, Mount Holyoke College, and Hampshire College to cross-register for classes or participate in some joint academic departments and programs.¹⁹ Member institutions agreed to establish the library consortium in 1999. Most of the start-up costs for the depository, including staff, were funded with a three-year grant from the Mellon Foundation. Upon expiration of the grant, the members assumed the maintenance and depository costs under a formula that reflects the size of each institution's library. Hampshire College, with a collection of 134,000 volumes, represents one unit of cost; Amherst (1.4 million volumes), Mount Holyoke (1 million volumes), and Smith (1.4 million volumes) each represent two units of cost; and the

¹⁸ Information in this section was provided by Jay Schafer, Director of Libraries, and Kathryn Leigh, Head, Access Services at University of Massachusetts, Amherst, MA, in telephone interviews, March 16, 2011, and May 2, 2011, and e-mail correspondence, March 28, 2011.

¹⁹ "A Collaborative Approach to Collection Storage: The Five-College Library Depository," Council on Library and Information Resources, n.d., <http://www.clir.org/pubs/reports/pub97/body.html> (accessed March 8, 2011).

University of Massachusetts, with its collection of 3.3 million volumes, represents four units of cost. FCLC is governed by the Five Colleges Librarians Council, to which the Depository Manager reports (see Figure 3).



Figure 3: Five College Library Consortium (front entrance to the “bunker” in Amherst, MA)
Source: Sarah Oelker, “Jorge Knows: The Five College Library Depository,” Mount Holyoke College Library, Information, and Technology Services blog, March 10, 2010, <https://pub.mtholyoke.edu/journal/LITS/entry/jorgebunker> (accessed April 6, 2011).

FCLC leases a building from Amherst College in Amherst, Massachusetts, that had once been a bunker controlled by the Strategic Air Command. All items placed in the depository become the property of Five Colleges, Inc., and are available to all members in perpetuity. This was not the initial policy. The University of Massachusetts had concerns that under Association of Research Library rules, items sent to FCLC would not be counted as part of the university’s collection. The Association has since reversed this policy. Additionally, as a state university, the University of Massachusetts initially had concerns about transferring ownership of public property to a private facility, but in the end there was no need to transfer ownership. The material placed in the facility by the University of Massachusetts formally remains the property of the university. In practice, however, it is viewed as common property by the members. The university has no intention of ever recalling the material. FCLC has decided over time to eliminate duplicates, with the understanding that the consortium would hold “the last copy in the valley.”

Prior to the establishment of FCLC, the colleges shared a library catalog. The existence of the shared catalog simplified the process of displaying records and holdings for FCLC and preempted the need to acquire separate software with which to manage holdings. Each member has a separate administrative module in the catalog. A sixth was added for FCLC. FCLC is considering increasing collaboration on electronic resources among the member institutions, the concept of which would mirror the administrative modules. Commonly licensed electronic resources would reside in one location, apart from independently owned material. Records for all commonly licensed materials would be maintained in the FCLC administrative module. Apart from these forms of sharing cataloging information, FCLC is discussing a proposal to use the MARC record 583 field for the depository collection in preparation for participation in a national network of depositories, which is being facilitated by CRL.

The bunker where FCLC stores its collection has physical advantages in terms of air handling and security, but space is limited. As a retrofitted space, FCLC is not a Harvard-style storage facility. Instead, the facility uses 12-foot-high movable shelving with trays that are one tray deep. It has the capacity to store 550,000 items and currently holds 440,000. Therefore, the consortium has obtained permission to conduct a feasibility study to explore the option of building a new Harvard-style module adjacent to the bunker.

The Director of Libraries at the University of Massachusetts-Amherst, Gerald “Jay” Schafer, who also serves on the council of FCLC, favors collaboration over “going it alone,” despite the existence of some minor tension among members.²⁰ Despite these concerns, Schafer believes that collaboration through a self-regulated private institution is easier than working as a public institution subject to state oversight and funding mechanisms.

Western Regional Storage Trust (WEST)²¹

The Western Regional Storage Trust (WEST) is a consortium of a large number of research libraries in the western United States, including but not limited to the 10 libraries of the University of California system.²² WEST is organized informally as a membership organization administered by the California Digital Library (CDL) through the office of the president of the

²⁰ Amherst uses the bunker for other purposes unassociated with FCLC.

²¹ Information in this section was provided by Emily Stambaugh, Shared Point Manager, California Digital Library, UC Office of the President, in telephone interviews, March 24, April 12, and April 28, 2011.

²² Emily Stambaugh, “Heading West: Circling the Wagons to Ensure Preservation and Access,” *Against the Grain*, November 2010, 18–22, <http://www.againstthegrain.com> (accessed March 24, 2011).

University of California. Member institutions generally belong to degree-granting institutions, but some exceptions include the Getty and Huntington libraries. More than 60 other libraries have expressed an interest in joining the consortium. The purpose of the consortium is to serve as a “distributed shared print repository program for retrospective journal archives.” CDL serves as the administrative host for WEST.

In October 2009, 20 libraries and library consortia began a planning process to consider various models of shared storage.²³ A \$70,000 grant from the Mellon Foundation supported the planning process,²⁴ which lasted until January 2011, when the Mellon Foundation awarded WEST a \$660,000 implementation grant to cover a three-year period.²⁵ The consortium plans to request one more three-year grant, after which member institutions will assume all of the consortium’s costs. Although the current grant covers much of the cost of implementation, members have been responsible for certain costs during this phase. WEST is currently in the process of finalizing membership agreements.

The outcome of the planning process was the decision to use multiple storage facilities, including full-service libraries on the condition that they maintain certain environmental conditions. WEST has designated five storage facilities thus far: the University of Oregon, Stanford University, the Northern Regional Library Facility of the University of California, the Southern Regional Library Facility of the University of California, and Arizona State University. Fifteen other archive holders will store lower-risk materials.

During the three-year implementation period, members have set a goal of archiving a certain number of volumes at certain institutions. WEST’s longer-term vision is to maintain a certain pace of acquiring archival commitments followed by the exploration of the possibility of adding monographs. However, no plans for archiving monographs exist at this juncture. Emily Stambaugh, Shared Print Manager of CDL, who is heavily involved in WEST planning and

²³ Participants included the University of California system, Stanford University, Arizona State University, the University of Washington, the University of Oregon, the other members of the Orbis Cascade Alliance, the Greater Western Library Alliance, and the Statewide California Electronic Library Consortium.

²⁴ Emily Stambaugh, “Mellon Planning Grant Awarded to UC Libraries for a Western Regional Storage Trust,” November 3, 2009, <http://www.cdlib.org/cdlinfo/2009/11/03/mellon-planning-grant-awarded-to-uc-libraries-for-a-western-regional-storage-trust/> (accessed March 17, 2011).

²⁵ Ellen Meltzer, “Mellon Grant Awarded to University of California Libraries to Implement the Western Regional Storage Trust (WEST),” California Digital Library, January 31, 2011, <http://www.cdlib.org/cdlinfo/2011/01/31/mellon-grant-awarded-to-university-of-california-libraries-to-implement-the-western-regional-storage-trust-west/> (accessed March 18, 2011).

implementation, indicated that the consortium had not experienced any significant problems in the initial phase. However, the intensity of the start-up activities, which include preparing institutions chosen as “archive builders,” has required strong leadership. Creating space is challenging because no capital funding exists for the construction of additional storage facilities—all storage space must be created within existing structures.

Stambaugh believes that the University of California made the correct decision to collaborate with other libraries in the western United States. The WEST consortium is quite large, and various institutions have different motivations and incentives for participating in a consortium. WEST members generally fall into three categories: institutions with a strong sense of stewardship that are reluctant to transfer holdings; institutions lacking storage space that have a strong interest in participating because it would allow them to aggressively deselect titles; and institutions interested in collaborating in targeted areas. The consortium is organized in a manner that enables it to address each institution’s needs. For example, some small-to-medium-sized libraries were eager to divest themselves of holdings because of cost and space constraints but needed guaranteed access to WEST holdings. Stambaugh believes that all these different-sized libraries with different needs can and want to support archiving commitments in exchange for access and a voice in decision-making about the collection.

The WEST model provides an avenue for financial contributions by smaller institutions where no such opportunity had previously existed. Prior to the existence of the WEST model, these smaller libraries had access to collections through inter-library loan, which was essentially a cost-free means of access. However, Stambaugh recognizes that this category of libraries actually wants to support the stewardship of the scholarly record elsewhere—these libraries do not want a free ride, but they had no alternative prior to WEST. The challenge then, according to Stambaugh, “is figuring out what services and guarantees the ‘client’ libraries may want and that result in a sustainable model across the network for continued collection development and management of print at a reduced number of locations.”²⁶

²⁶ E-mail correspondence from Emily Stambaugh, Shared Print Manager, California Digital Library, University of California Office of the President, April 28, 2011.

Yale University Storage Facility (YUSF)²⁷

The Yale University Storage Facility (YUSF) was established in 1998 after the university considered the possibility of developing cooperative solutions to the problem of storage space with other university libraries.²⁸ While considering its options for site selection in 1995, Yale found that other schools were interested in sites located too far removed from campus. For example, the Harvard Depository was inconveniently located 35 miles from Yale. Ultimately, Yale decided to build a new Harvard-style facility 3.5 miles from the center of New Haven, Connecticut, and has undergone two expansions since it was established: the first in 2001 and the second in 2005. The expansions increased the facility in size from six aisles to 28 aisles (see Figure 4). Although Yale uses the same inventory software as Harvard, it does not use the billing module because it does not have any customers.

In the 1960s, a precursor storage facility at Yale faced opposition from the faculty because they believed they had not been adequately consulted regarding the selection of materials for storage. Seeking to remedy this oversight, YUSF coordinated subject selection of materials with faculty and consulted with them in the decision to store low-use materials and to identify in the online catalog which books had been selected for off-site storage. According to YUSF's director, the facility has been able to overcome faculty concerns and has successfully met its service commitments. Currently, Yale is reorganizing its campus library facilities. It is abolishing the Seeley J. Mudd Library, which is a shelving facility not open to readers. General collection material held at Mudd is being transferred to YUSF, which will increase the number of materials stored at YUSF from the current 4.25 million items to 6 million items. YUSF has the capacity to handle another three to five years of normal transfers of materials following the completion of the Mudd Library transfers.

²⁷ Information in this section was provided by Michael DiMassa, Director, YUSF, New Haven, CT, in a telephone interview, March 28, 2011, and e-mail correspondence, March 30, 2100.

²⁸ "Yale University Library Shelving Facility: About Us," Yale University Library, December 7, 2010, <http://www.library.yale.edu/lst/> (accessed March 22, 2011).



Figure 4: Yale University Storage Facility (in New Haven, CT)
Source: Photo provided by Michael DiMassa, director of the facility

YUSF relies on Yale’s general library budget for funding and has not encountered any significant unexpected costs. Reasons for this include the use of productivity studies, which have kept the staff small; the use of regular fill-rate studies for planning purposes; and the lack of any problems with environmental controls.

Michael DiMassa, the director of YUSF, cited several advantages to maintaining a dedicated, single-institution facility over a consortial arrangement. The most important advantage is complete control, including control over “clients,” which eliminates governance conflicts. Because YUSF’s budget is part of the general library budget, the facility enjoys enormous flexibility in developing and implementing internal procedures. The facility never needs to cancel shipments because of changes in amounts of material scheduled to be delivered, as can happen at shared storage facilities. DiMassa cited as another advantage the fact that YUSF never needs to reconfigure shelving based on demand for space because space at the facility is not designated for more than one institution. If YUSF shared space with outside institutions, the possibility would exist for one institution to request shelf space that had been designated for a

different institution. However, YUSF only stores materials from Yale University libraries and therefore does not need to concern itself with re-allocating or reconfiguring shelf space.

Florida High Density Facility and Shared Collection

The Florida Council of State Universities is planning a Harvard-style shared storage facility for low-use material. Eleven state institutions would participate in the High Density Facility and Shared Collection.²⁹ The University of Florida in Gainesville would be the administrative host. The University of Florida currently maintains an Auxiliary Library Facility with conventional shelving and items organized by call number. This original facility would be remodeled, and a new high-density storage facility with a capacity of 5.2 million volumes would be built adjacent to it (see Figure 5). The renovation of the original facility would be completed and the new facility put into operation in 2013–14, according to current plans.³⁰ Florida's plans to adopt the Harvard high-density storage model attest to its continued viability.



Figure 5: Concept drawing of planned shared storage facility at the University of Florida (research building and storage module at far left in Gainesville, FL)

Source: “Offsite Storage of Library Materials in Florida: Current Situation and Future Plans, Images for the Statewide Storage Task Force,” June 2010, http://csul.net/storage/SSTF_Images_2010_FINAL.pdf (accessed April 6, 2011).

²⁹ These institutions are the Florida Agricultural and Mechanical University, Florida Atlantic University, Florida Gulf Coast University, Florida International University, Florida State University, New College of Florida, University of Central Florida, University of Florida, University of North Florida, University of South Florida, and University of West Florida.

³⁰ Operating expense timeline letter from Judy Russell, Dean of the University of Florida Libraries, July 15, 2010, http://csul.net/storage/High_Density_Facility_ltr_07-15-2010.pdf (accessed April 12, 2011).

Fort Meade Storage Facility³¹

In 1993 Congress enacted legislation mandating the U.S. Army to transfer, by September 30, 1994, “without reimbursement or transfer of funds, to the Architect of the Capitol, a portion of the real property, including improvements thereon, consisting of not more than 100 acres located at Fort George G. Meade in Anne Arundel County, Maryland.”³² The Architect of the Capitol is directed to “utilize the transferred property to provide facilities to accommodate the varied long-term storage and service needs of the Library of Congress and other Legislative Branch agencies.” According to Steven J. Herman, Chief, Collections Access, Loan and Management Division, the Library of Congress had three criteria for an off-site storage location, all of which were met by the Fort Meade site:

- Accessible within one hour from Capitol Hill
- Available undeveloped land instead of a building requiring retrofitting
- Expandable space for future modules

Once the Fort Meade property became available for Library of Congress use, two storage options were considered: a robotic automated storage and retrieval system and a Harvard-style facility. The decision was made in favor of the Harvard-style facility, partially for cost reasons. In addition, robotic retrieval is inappropriate when the facility is not immediately adjacent or at least very close to a library. Otherwise, the speed of retrieval will have no impact on customer service (see Figure 6).

³¹ Information in this section was provided by Steven J. Herman, March 24, 2011, and during a site visit by the research team to Fort Meade, March 29, 2011.

³² Military Construction Appropriations Act, 1994, Pub. L. No. 103-110, §122, 107 Stat 1043, 1044, October 21, 1993.



**Figure 6: Library of Congress High Density Storage Facility
(close-up of barcoded box at Fort Meade, MD)**

Source: Photo by Seth Elan

Material consists of “books and bound periodicals as well as special-format collections, such as maps, manuscripts, prints, photographs, sheet music, and microfilm masters.” However, material does not include movie images or recorded sound stored at the National Audio-Visual Conservation Center in Culpeper, Virginia. The selection criteria for storing an item at Fort Meade are as follows:

- Low use (although this is an estimate, because the Library does not keep records of use)
- Easy to retrieve by author or title (i.e., children’s literature, fiction, second copies, books that receive minimal level cataloging [“MLCs”], and journals that are available in electronic databases such as JSTOR and Project Muse)

As of April 2011, four modules and four cold storage rooms have been constructed. Altogether, the Fort Meade site has a capacity for 13 book storage modules. The Library’s

proposal to fund a fifth module has thus far been rejected by Congress. However, the Library of Congress holds enough collection materials requiring off-site storage to fill seven modules.

Material is stored by size in boxes of 10 different dimensions. The shelving is 30 feet high. Items are identified and tracked by barcode. Incoming material is vacuumed, measured, and placed into 18-inch boxes. Boxes are stored on 36-inch double shelves.

The facility uses two inventory control systems:

- The Library of Congress Integrated Library System (ILS)
- The Library Archival System (LAS), developed at Harvard and now maintained by Generation Fifth Applications Inc. of Cornish, Maine

The ILS features bibliographic records, holding records, and item records (for each artifact). Every inventoried item is in the ILS. Transferring an item to Fort Meade entails the following:

- A change of location in the item record
- The addition of a field to the call number
- A label for the item indicating permanent ownership

The LAS requires all of the items in a box to be scanned, along with a running count. The boxes, for which the number of items is recorded when it is full, are also scanned. The shelves are scanned as well. Therefore, all items can be barcode-linked by box, shelf, and position on the shelf. According to Steve Herman, the LAS is good for tracking materials. The ILS and LAS are not linked and do not interact.

When a reader on Capitol Hill requests an item, a request slip is automatically printed out at Fort Meade. The facility makes twice-daily deliveries to Capitol Hill. Items returned to Fort Meade go into a refills queue. Not all items have been returned because some are being held by members of Congress or staff.

With regard to preservation specifics, the facility's environmental controls include maintaining a temperature of 50° F and relative humidity of 30 percent. The facility also uses sodium-vapor lamps and an air exchange filter system to improve environmental conditions. As a result, the life expectancy of material is six times greater at Fort Meade (240 years) than on Capitol Hill (40 years). Fire suppression is maintained by Vesda smoke detectors, water sensors, and change-in-temperature sensors. Materials themselves are held in lidded boxes, which provide the materials with slightly better preservation than at Harvard, which does not use lidded boxes.

The boxes are water-resistant—but not waterproof—which affords some protection to the materials if water sprinklers were activated for fire suppression.

The Library of Congress also uses two other off-site storage facilities. One, in Landover, Maryland, is rented from the General Services Administration (GSA), and the other is an Iron Mountain facility. The materials stored in Landover are part of an active collection and are deliverable by truck daily. However, these materials need to be moved to a new location—ideally, this would be Fort Meade, but currently that is not an option. Therefore, a committee has been looking at other options such as NARA/FRC facilities. The FRC facility in Suitland, Maryland, does not appear to be appropriate because of insufficient environmental controls. The materials stored with Iron Mountain are essentially “dark-archive” materials. They are infrequently removed from storage; however, if LC does try to remove items it is highly difficult. The facility is also reportedly quite expensive to use.

Summary

In terms of organization, the facilities described above represent a range of high-density storage facilities. FCLC, WRLC, and the planned Florida facility are examples of initiatives that build on long-standing, broad cooperation among the member institutions. For example, prior to the establishment of FCLC, the Five Colleges in Massachusetts had already provided for course cross-registration and reciprocal library borrowing privileges. By contrast, Princeton and Columbia, although members of the Ivy League, did not have such a tradition of institutional cooperation, nor did they coordinate their activities with the NYPL. Therefore, ReCAP represents a new cooperative venture for the participating institutions. FCLC, WRLC, and ReCAP have been described as cooperative library consortia. Yale University, however, decided to “go it alone” with its dedicated storage facility. The Harvard Depository is *sui generis*, in that until now Harvard University has been in control and has served a range of internal and external customers. However, the Harvard Depository is evolving into a more collaborative relationship with MIT, as duplicate materials in the collection are eliminated.

The advantages of going it alone are control, including control over customers; independence; and flexibility in developing and implementing internal procedures. In addition, there is no problem with cancelled shipments resulting from the delivery of not enough or too much material. Because space is not designated for more than one institution, there is no need to

reconfigure shelving based on demand for certain-sized material. Finally, there is no need for a software module for billing. On the other hand, consortia offer an equally compelling set of advantages, specifically synergies through cost savings and economies of scale. Consortia managers often believe that no single member institution could build or maintain such a facility.

SHARED STORAGE: AN OPTION FOR FEDERAL LIBRARIES

Historical Overview

For the past 50 years, federal librarians have faced the problem of insufficient storage space for their respective collections and have considered the concept of cooperative storage facilities as a solution. In 1961 Paul Howard, Librarian of the U.S. Department of the Interior, predicted that by 1980 “a federal library storage center will be a necessity and will have been organized but will be experiencing problems of communication and policy.”³³ In the following decade, researchers noted that “Federal Libraries are moved to cooperate by the same forces that influence other types of libraries. They face a dearth of resources, a heavy demand in a broad array of subjects from a vigorous and growing constituency [sic], and wide dispersion of resources. As all libraries do, they face the still-increasing volume of publication and information, and the seemingly inexorable inflation of the costs of all resources required for library service.”³⁴ Decades later, no shared federal library storage facility yet exists, but these comments continue to reflect the dilemma faced by federal libraries today.

In 1963 the Brookings Institution advocated a shared federal library storage facility in its report *Federal Departmental Libraries: A Summary Report of a Survey and a Conference*. The authors of the report suggested that such a facility could be a “cheap storage building, perhaps in a mountainside near Washington,” and speculated that the cooperative effort might work like this: all “major federal libraries would contribute to the management and administration on a cooperative basis, perhaps under the leadership of the General Services Administration.” Just as would be desired today, in 2011, requested materials would be delivered within a day. Perhaps not quite as sophisticated as might be the case today, the imagined facility in 1963 would maintain brief catalog entries that would be provided to cooperating libraries. The authors of the Brookings report suggested that this arrangement would allow libraries to discard excess copies,

³³ Paul Howard, “Libraries in the Federal Government,” *Library Trends* 10, no. 2 (October 1961): 85.

with the storage facility acting as a type of second reserve. Depositing libraries would control their contributions, at least temporarily.³⁵

No cooperative federal library storage facility was established in the decade following the Brookings report. In 1973 the General Accounting Office (GAO) urged that federal libraries expand cooperative practices and specifically suggested that federal libraries develop a storage facility for little-used material.³⁶ In conducting research for its report, the GAO spoke with 44 federal librarians, 16 of whom reported that they no longer had any space to accommodate growth in their collections; 18 reported that they had five years or less of space to grow; and 10 reported no problems with space. GAO suggested that the federal library storage problem in the Washington, DC, region could be solved with the establishment of a central depository for housing little-used materials.³⁷

The problem remains unresolved. In September 2008, the FLICC Special Project on Planning for Library Spaces published a report titled, *Leadership in Uncertain Times: Federal Librarians Envision Use of Physical Space Through 2020*. Although the report did not focus specifically on storage options, the authors' findings indicate that a need for more storage space still exists among some libraries and that the option to share remains a viable and preferred option for a minority of libraries. Librarians have been experiencing decreasing amounts of shelving space and have worked to fit collections into existing or diminishing shelf space. Implemented solutions to this space issue have included the installation of compact shelving, reducing the collection size, and introducing digital versions of selected publications. Few librarians expected full virtualization within the coming decade, in part because of the expense involved in the digitization of collections and the expectation that budgets and staffing would remain static over the next 10 years. According to the report, 51 percent of 166 respondents reported that they did not anticipate their agency's library would use off-site storage in the

³⁴ Russell Shank and Madeline Henderson, "Federal Library Cooperation," *Library Trends* 24, no. 2 (October 1975): 277.

³⁵ Harold Orlans, ed., *Federal Departmental Libraries: A Summary Report of a Survey and a Conference* (Washington, DC: Brookings Institution, November 1963), 12.

³⁶ Shank and Henderson, "Federal Library Cooperation," 282.

³⁷ U.S. General Accounting Office, *Review of Federal Library Operations in Metropolitan Washington* (B-174013, July 24, 1973), 12–13, <http://archive.gao.gov/f0302/096133.pdf>.

future; 10 percent reported that they expected off-site storage to increase; and 9 percent indicated that they planned to share off-site storage with other institutions.³⁸

Current Situation: Survey Findings

In an effort to gauge current interest in shared storage among federal libraries, FRD researchers distributed a survey via e-mail to approximately 60 federal librarians in the Washington, DC, metropolitan area. The survey sought to ascertain to what extent federal librarians are experiencing collection capacity issues, and, if they are facing space issues, whether they would be interested in joining a consortium of federal libraries that would address off-site storage collaboratively. The survey asked five questions:

- 1) Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?
- 2) If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?
- 3) Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?
- 4) Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?
- 5) Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?

The researchers received 19 responses, out of which nine answered “no” to Question 1 and ten, “yes.” At least three of the “no” respondents have storage facilities that they already use, or plan to use, and therefore would not be interested in joining a consortium for storage purposes. One of the “no” responses expressed the possibility of joining a consortium at a later date in the

³⁸ Brook Darnell et al., *Leadership in Uncertain Times: Federal Librarians Envision Use of Physical Space Through 2020* (FLICC Special Project on Planning for Library Spaces, September 11, 2008), 14–15, 17, <http://www.loc.gov/flicc/about/FLICC%20WGs/LET/Leadershipthroughuncertaintimes/Final%20FLICC%20survey%20report%202-3-09.pdf> (accessed March 31, 2011).

event of future downsizing. Of the ten “yes” responses, one indicated a space issue requiring immediate attention, including problems with rare book storage.

Of the ten librarians who answered “yes,” five were able to provide details in their answers to Question 2 about the types of materials and the size of the collections they would be interested in storing in a shared facility. These materials include print monographs and serials as well as microform items. Not all responses included the number of items, but of those librarians who did provide a figure, the total number of items exceeds 1 million volumes plus 14 cabinets of microfiche. One response indicated that 15 to 20 percent of a collection exceeding 150,000 volumes needs off-site storage; another response indicated that up to 50 percent of a collection numbering 130,000 items needs to be stored remotely; 10 percent of a 4.5 million-volume collection needs storage; 10 to 20 percent of a 300,000 volume collection needs storage; and 30 percent of a collection exceeding 600,000 volumes needs off-site storage.

In answering Question 3, five librarians indicated that some materials have already been digitized but that more would be digitized in the future. Two librarians indicated that their collections had not been digitized. One librarian indicated that most materials had not been digitized and that the library’s plans did not envision digitizing all items slated for storage. One librarian responded that many, but not all, materials had been digitized. Those that had not been digitized were not part of a long-term digitization plan. One librarian indicated that future digitization would be conducted with the plan to send print copies to storage.

Eight out of nine librarians answered “yes” to Question 4—their collections contain rare and difficult-to-replace items. Two librarians expressed definite interest in placing such items into a “dark archive,” which would severely restrict access and circulation; one institution would require some restrictions placed on use of those items but does not want to use a dark archive; four librarians indicated having no interest in using a dark archive. Reasons included the fact that their libraries circulate rare books on a restricted access basis, and/or their mission is more concerned with access than with preservation at any cost. One librarian indicated that rare materials would likely not be sent to storage, but if they eventually were sent, the dark-archive option would be the preferred option. One library expressed interest in digitizing a certain set of rare items, which would simultaneously preserve the items and access to the information. The sole librarian indicating that no rare items existed in the library’s collection commented that his/her institution may actually be interested in a dark archive.

In answering Question 5, all but two librarians indicated a willingness to lend materials in storage to other consortium members. However, many expressed some reservations and suggested some conditions that might be placed on lending. Others would not restrict circulation but expressed a need to have controls on circulating material, such as penalties for loss or damage. One librarian suggested it would be helpful to have feedback regarding usage so that his institution could prioritize future digitization. One librarian indicated that items could be circulated without a problem because the collection is already available through interlibrary loan.

Clearly, not all federal libraries need or want shared storage space. But among those that do, survey responses indicate that a variety of needs must be addressed if federal libraries wish to form a successful storage consortium. Because of differences in missions and differences in materials, some libraries need access to dark archive-type storage, whereas others prefer to keep their items in circulation. Moreover, some librarians have indicated that sharing storage does not translate directly into shared collections, and their libraries will require that restrictions be placed on their material. Overall, however, the survey responses indicate a fairly high level of enthusiasm about the possibility of forming a federal consortium for the purpose of storing material. Complete survey questions and instructions as well as all survey responses are provided in Appendix 2.

NARA AND NARA-COMPLIANT STORAGE FACILITIES

The National Archives and Records Administration (NARA) is authorized by statute to promulgate standards, procedures, and guidelines to federal agencies with respect to the storage of their records in commercial records storage facilities.³⁹ Regulations governing the operations of federal agencies are codified by subject in the Code of Federal Regulations (CFR). Title 36, chapter 12, of the most recent edition of the CFR (July 2010) covers NARA. More specifically, Part 1234, Subpart B, addresses “the establishment, maintenance, and operation of records centers, whether Federally-owned and operated by NARA or another Federal agency, or Federally-owned and contractor operated.”⁴⁰ This section of the CFR specifies the minimum structural, environmental, property, and life-safety standards that a records storage facility must meet when the facility is used for the storage of federal records (see Appendix 1).

³⁹ 36 CFR § 1234.1.

⁴⁰ 36 CFR § 1234.2.

Federal agencies have the option to store materials at NARA centers or other NARA-compliant facilities, including commercial storage facilities that contract with the government. NARA Federal Record Centers (FRCs) are facilities where federal agencies can store their records—usually administrative records but also library collection materials. Although NARA FRCs are distributed throughout the country and are compliant with NARA’s regulations, from a preservation standpoint, not all FRCs are appropriate for storing library materials.

The three centers most appropriate for the storage of library materials are those located underground in former limestone cave mines. These cave complexes—located in Lenexa, Kansas; Lee’s Summit, Missouri; and Valmeyer, Illinois—are 80 feet underground, which means materials stored there enjoy stable temperature and humidity levels—Valmeyer, for example, is a stable 61.5° F and 50.8 percent relative humidity. Additionally, these complexes are protected from anything potentially destructive occurring at the surface, such as extreme weather events.

NARA has the capability to expand at each of these facilities, making storage capacity nearly infinite. For example, the total area of the cave complex in Valmeyer, Illinois, is approximately 5.5 million square feet. The average storage bay is 40,000 square feet, and NARA has built 14–16 storage bays at the Valmeyer facility to date⁴¹ (see Figure 7 for a sense of the expansion potential at these cave complexes. An example of a finished storage bay can be seen in Figure 8).



Figure 7: Future expansion potential at the Valmeyer, IL, facility
Source: NARA

⁴¹ Information was provided by Ron Mitchell, National Accounts Manager for NARA Federal Records Center, in a telephone interview, April 21, 2011.



Figure 8: A storage bay at the Lenexa, KS, facility
Source: NARA

Several commercial facilities have begun marketing their NARA-compliant facilities. The largest and best known of these companies is Iron Mountain. In order to achieve compliance, Iron Mountain contracted third-party, multidisciplinary engineering teams to work with NARA in order to fully understand the requirements of CFR compliance. These teams then designed, built, and audited each of Iron Mountain’s federal records facilities, which have been inspected by an independent engineering firm and certified as CFR-compliant. In September 2009, Iron Mountain announced that it had begun accepting hard-copy records from federal agencies at its four NARA-compliant facilities in Redlands, California; Kansas City, Missouri; Elgin, Illinois; and Fredericksburg, Virginia.⁴²

Like Iron Mountain, Diversified Information Technologies has opened four NARA-compliant facilities. They are located in Moosic, Pennsylvania; Delano, Pennsylvania; Gordonsville, Virginia; and Jacksonville, Florida. The company’s President and CEO, Scott Byers, stated that Diversified is proactive in engaging the NARA certification process as part of its dedication to securing federal client records.⁴³

Source One, Inc., headquartered in Denver, Colorado, currently manages two NARA-compliant storage facilities in Morgantown, West Virginia, and Carlsbad, New Mexico. Like

⁴² Iron Mountain, “Iron Mountain Opens Special Storage Facilities to Help Federal Records Keepers Meet Oct. 1 Regulatory Deadline” (press release, September 22, 2009), <http://www.ironmountain.com/news/2009/impr09222009.asp> (accessed March 29, 2011).

⁴³ Diversified Information Technologies, “Diversified Information Technologies Announces Fourth Records Storage Center that Complies with 36 Code of Federal Regulations (CFR) Part 1228, Subpart K” (news release, March 15, 2010), http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20100315006609&newsLang=en (accessed March 29, 2011).

Iron Mountain, Source One was involved in the ground-up design of each facility in order to achieve certified compliance.⁴⁴

All facilities provide essentially the same service by offering to store items in a secure location. However, ease of retrieving materials and pricing varies from company to company. Companies typically charge a base cost per cubic foot of space displacement per month, ranging from \$0.16 to \$0.27, plus other fees that may or may not be one-time fees. For example, NARA has a one-time fee for each box that is placed in storage, which covers opening pallets of boxes, verifying the shipment, keying the boxes into NARA's ARCIS system, assigning box locations, and delivering the boxes to their assigned locations, whereas commercial companies bill for each separate step of the accessioning process. As long as the boxes are in storage, the federal agency is billed monthly per box—NARA charges \$0.21 per box, Iron Mountain charges \$0.27 per box, and Diversified Information Technologies charges \$0.16 per box. NARA also charges various fees for retrieval requests, largely dependent on how quickly the agency needs its material, which is also typical of commercial facilities, although the rates vary considerably, with commercial facilities typically charging more than NARA. Commercial facilities, such as Iron Mountain, also bill for monthly billing services—varying rates exist depending on how detailed an agency has requested its bill to appear. NARA does not charge for billing.⁴⁵

LIBRARY OF CONGRESS PROCEDURES FOR BOOK PRESERVATION AND COPY SELECTION IN CONJUNCTION WITH ARCHIVAL STORAGE

General Practices for Selecting Material for Archiving

Many libraries and library consortia have created off-site storage facilities to address overcrowding of materials in their collections, and they frequently have used pre-established criteria to identify items that can best relieve overcrowding in their on-site holdings if stored off-site. No standardized terminology exists for the criteria that institutions have used to select materials for archiving, but frequently used selection criteria can be categorized as follows:

⁴⁴ Source One Management, Inc., "Records Management Consulting," http://www.sourceone.com/index.php?option=com_content&view=article&id=59:records-management-consulting&catid=38:all-services&Itemid=29 (accessed March 29, 2011).

⁴⁵ Iron Mountain, "Iron Mountain General Services Administration Federal Acquisition Service: Authorized Federal Supply Schedule Pricelist," Schedule 36: GS-25F-006M, October 14, 2010, https://www.gsaadvantage.gov/ref_text/GS25F0066M/0IIHH6.27U1G5_GS-25F-0066M_IM36M32A.PDF (accessed April 19, 2011); Diversified Information Technologies, "Authorized Federal Supply Schedule Price List," GS-25F-0005P, January 2009,

- Time period: Archiving materials that occupy significant shelving space (sometimes called “retrospective archiving”) or reserving archival space for materials to be published in both print and electronic editions, collectively purchasing such materials, and sending print materials directly to a print archive (“prospective archiving”).
- Format: Archiving materials based on their format, such as journals or monographs.
- Digital Availability: Archiving print materials that exist in a digital form in a database or a repository; this criterion is sometimes referred to as “publisher.”
- Subject area: Archiving material based on its subject area or “domain,” such as agriculture, history, or law.
- Patron usage: Archiving materials based on the extent to which patrons use them with “lesser used” items selected for off-site archival storage.
- Library-nominated titles: Archiving materials based on other criteria.⁴⁶

A 2010 study by the Center for Research Libraries (CRL) of 13 print archives and library consortia in North America found that most of these institutions retrospectively archived journals available in digital databases or repositories.⁴⁷ One reason for the commonality of this approach is that the availability of digital versions of journals through databases or repositories allows libraries and other institutions to archive print editions of journals without affecting patrons’ access to the information contained in them. Second, because a single journal title includes multiple volumes, a single journal title occupies more shelf space than a single monograph title; thus, a decision to archive a journal title removes more materials from library shelves.⁴⁸ Finally, administrators of off-site storage facilities have found that journals represent a significant portion of redundant items in storage.⁴⁹

https://www.gsaadvantage.gov/ref_text/GS25F0005P/0GFL95.2003RO_GS-25F-0005P_DITSIPJAN.PDF (accessed April 19, 2010).

⁴⁶ Lizanne Payne, “Models for Shared Print Archives: WEST and CRL,” slide 5, http://ucblibraries.colorado.edu/collectiondevelopment/shared_Payne_infrastructure.pdf (accessed April 11, 2011); Interview with Ronald B. Roache, Supervisory Librarian, Collections Access, and Loan, and Management Division, Library of Congress, April 20, 2011.

⁴⁷ Center for Research Libraries, “CRL Print Archives Network, Meeting with Consortium Partners, Monday February 22, 2010,” 2, <http://www.crl.edu/sites/default/files/attachments/pages/CRL%20Print%20Archives%20meeting%202010%2002%2022%20summary.pdf> (accessed April 11, 2011).

⁴⁸ Interview with Emily Stambaugh, Shared Print Manager, California Digital Library, March 31, 2011.

⁴⁹ Interview with Bruce Hulse, Director of Information Services, Washington Research Library Consortium, April 18, 2011; Interview with Eileen Henthorne, Executive Director, Research Collections and Preservation Consortium, April 19, 2011.

Library of Congress Selection Criteria for Archiving Print Materials

The Library of Congress has used several criteria in selecting items for off-site archival storage, and it has used different sets of criteria to select materials for archiving at different off-site facilities (see section titled “Fort Meade Storage Facility” for a more detailed discussion of that facility). Library of Congress selection criteria for materials archived at off-site facilities have been the following:

- **Patron Usage:** Many of the materials that the Library has selected for storage at Fort Meade have been items that are used less than other materials. According to Steven J. Herman, Chief, LC Collections Access, Loan and Management Division, although Fort Meade stores 3.4 million items, there have only been 130,000 requests for items from this facility.⁵⁰
- **Preservation:** The Library of Congress has an active preservation program for print and other materials in its collection, and the program’s activities include such things as binding, boxing, and deacidification of paper items. The Library’s interest in preservation was among the reasons that it created off-site storage facilities that provide environmentally regulated storage for paper- and film-based materials.⁵¹
- **Second copies:** Under its selection policies, the Library retains duplicate copies of some, but not all, items, and many of the items stored off-site are duplicate copies (or “copy two’s”) of materials in its collections.⁵²
- **Intellectual Property Rights:** The Library of Congress has archived print materials not covered by U.S. copyright law—i.e., public-domain materials—including government documents and print materials that were published before 1923, many of which were in fragile condition.⁵³ The Alfred P. Sloan Foundation gave LC a US\$2 million grant in 2007 to create digital copies of materials published before 1923 and to make those items publicly available through the Library’s Web site. The Library has digitized these items and stored the actual materials at Fort Meade.⁵⁴

⁵⁰ The Library of Congress does not keep records of patron usage of materials. Thus, the designation of items as “lesser use” is not based on patron usage statistics; instead, authorized Library staff members recommend materials for off-site storage based on their estimations of patron usage of those items. Interview with Ronald B. Roache, Supervisory Librarian, Collections Access, Loan, and Management Division, Library of Congress, April 20, 2011.

⁵¹ Library of Congress, Preservation Directorate, “Services of the Conservation Division,” <http://www.loc.gov/preserv/conserv.html> (accessed March 22, 2011); Gail Fineberg, “Preserving, Storing, Retrieving: Ft Meade Module Construction Continues,” *Library of Congress Information Bulletin* 66, no. 3 (March 2007), <http://www.loc.gov/loc/lcib/0703/ftmeade.html> (accessed April 13, 2011).

⁵² Interview with Michael Handy, Deputy Associate Librarian of Library Services, Library of Congress, May 3, 2011; Jeanette Adams, “Fort Meade is Cool, CALM, and Collected,” *Library Services Journal* 1, no. 3 (Fall 2008): 26, <http://www.loc.gov/preserv/pub/fortmeade.pdf> (accessed April 13, 2011).

⁵³ Interview with Steven J. Herman, Chief Collections Access, Loan, and Management Division, Library of Congress, March 25, 2011.

⁵⁴ Gail Fineberg and Jennifer Gavin, “Preserving Fragile Books: Embrittled Books Find New Life in Digital Form,” *Library of Congress Information Bulletin* 68, no. 3 (March 2009), <http://www.loc.gov/loc/lcib/0903/books.html>

- Subject area: The Sloan Foundation grant identified several areas on which the Library should focus its digitization activities, including American history and U.S. genealogy. The Library has digitized these materials and stored the print versions in off-site storage.⁵⁵
- Special Format Materials: The Library has selected materials that have special storage requirements for archive at Fort Meade. These materials include children’s books—many of which have fold-outs—miniature books, and oversized “folio” books.
- Ease of Access: Among the reasons that the Library has selected monographs for storage at Fort Meade is that they are easy to access by patrons and storage-site staff. Patrons using the Library of Congress catalog can easily identify monographs by author and title, and storage-site staff can also easily locate books by author and title. By contrast, the authors and titles of serial articles are more easily identified through journal databases rather than library catalogs.
- Digital Availability: The Library has utilized the Fort Meade facility to archive items that are digitally available through subscription databases.⁵⁶ In addition, the Library is considering additional off-site storage for more than 800,000 items that are available electronically through a digital repository called the HathiTrust.⁵⁷

Cataloging Tools for Identifying Redundancies of Items Going into Storage

The administrators and member institutions of many library consortia prohibit the storage of duplicate copies of an item in their shared storage facilities.⁵⁸ Some consortia that initially allowed duplicates later adopted policies prohibiting the storage of redundant items, and others are actively considering adopting such policies. Libraries and library consortia prohibit the storage of duplicate items because storing redundant items undercuts the purpose of creating off-site storage facilities to remedy overcrowding in libraries’ on-site facilities. Many libraries and consortia have concluded that storing duplicate items unnecessarily increases the costs of storing those particular items, reduces storage space for other materials, and contributes to the need for constructing additional storage facilities.⁵⁹

(accessed April 6, 2011); Library of Congress, “Locating Materials Marked ‘Do Not Serve’ or ‘Unavailable’ in the Library’s Online Catalog,” <http://www.loc.gov/rr/genealogy/MarkedDoNotServe.pdf> (accessed April 13, 2011).

⁵⁵ Library of Congress, “\$2 Million Sloan Foundation Grant to Help Digitize Thousands of Books,” <http://www.loc.gov/today/pr/2007/07-020.html> (accessed April 13, 2011).

⁵⁶ Adams, “Fort Meade is Cool, CALM, and Collected,” 26.

⁵⁷ Interview with Michael Handy, Deputy Associate Librarian for Library Services, Library of Congress, and Aaron Chaletzky, Digital Library Specialist, Library of Congress, April 8, 2011.

⁵⁸ Center for Research Libraries, “CRL Print Archives Network, Meeting with Consortium Partners, Monday February 22, 2010,” 14–15.

⁵⁹ Information in this section was obtained through telephone interviews with Eileen Henthorne, Executive Director, Research Collections and Preservation Consortium (March 10, 2011); Bruce Hulse, Director of Information

In order to identify redundant items and prevent them from being stored in a shared off-site facility, library consortia administrators and members make two related, but distinct, decisions for items in their collections:

- 1) “Collection analysis”: Identifying duplicate items among combined collections of consortia members and items that exist in both members’ collective holdings and in a shared off-site storage facility;
- 2) “Decision support”: Recording decisions as to the particular copy or copies of duplicate items that will be archived and disclosing such information to consortia members so that they can dispose of—or “de-access”—their redundant items.

Specialists sometimes refer to a tool that can provide information for de-duplication and decision support as a “collection analysis tool.” At present, no collection analysis tool is sufficient for these purposes. OCLC’s WorldCat is North America’s principal “union catalog”—a catalog that lists the collections of numerous libraries—but is an insufficient system for use as a collection analysis tool. WorldCat cannot reliably support de-duplication, because libraries independently create and submit the bibliographic data that is in WorldCat, resulting in variation in the information in those independently created records. While WorldCat shows bibliographic titles that are held by multiple institutions, the system also contains duplicate and varying bibliographic records for the same titles. Moreover, accurate holdings information often is not contained in WorldCat but rather in libraries’ own local catalogs. This characteristic of WorldCat limits the ability of institutions to use the system to assess the edition, quality, and other characteristics of shared holdings and therefore to select particular items to archive. WorldCat has an additional disadvantage in that it cannot provide decision support, because the system does not feature a data field with a level of detail needed to display information about individual libraries’ archiving actions.

Because neither WorldCat nor any other system has proved to be a sufficient tool for collection analysis, administrators and institutional members of shared archives have used a variety of approaches for collection analysis and decision support. Some library consortia have

Services, Washington Research Library Consortium (April 18, 2011); Kathryn Leigh, Supervisor, Five College Library Consortium (April 18, 2011); Lizanne Payne, Print Archives Program Manager, Center for Research Libraries (April 12, 2011); Matthew Sheehy, Assistant Director of the Harvard University Library for the Harvard Depository (March 30, 2011); and Emily Stambaugh, Shared Print Manager, California Digital Library (interviewed March 31, 2011).

used their own respective union catalogs to obviate storage of duplicate items, and some have used spreadsheets to analyze library holdings data supplied by consortium members.

No particular method or system has emerged as a widely used utility for identifying and preventing the storage of redundant items. Numerous libraries, library consortia, and research institutions have expressed interest in moving beyond such individual, ad-hoc efforts and towards a system that numerous organizations can use for collection analysis and decision support.⁶⁰ There are at least two such systems under development.

The California Digital Library (CDL) and the Center for Research Libraries (CRL) began jointly developing a system called the Print Archives and Preservation Registry (PAPR) in January 2011. The nonprofit organization ITHAKA, which specializes in the use of digital technologies for preservation of scholarly materials, is consulting on the project, which is expected to be completed in January 2012.⁶¹ OCLC, the custodian of WorldCat, began developing its own system in November 2010, but as of April 2011, the company had not announced a name for the system or an expected completion date.⁶²

Both of these systems under development will incorporate the same data that WorldCat and other bibliographic systems have used, but they will incorporate that data more extensively to provide services that WorldCat and other systems have not supported. The data come from a bibliographic record system called Machine-Readable Cataloging, or “MARC,” which contains hundreds of standardized data fields, or “tags,” that libraries worldwide use to document numerous characteristics of library materials, such as title, author, subject, actions taken by cataloging staff, etc.⁶³ The systems that CDL/CRL and OCLC are developing are distinct from WorldCat and other existing bibliographic systems in that they plan extensively utilize an existing but little-used MARC data field—MARC 583 or “Action Note”—to support collection analysis (i.e., to identify duplicates) and decision support (i.e., to record and disclose archiving

⁶⁰ Interview with Lizanne Payne, Print Archives Program Manager for the Center for Research Libraries, April 12, 2011; Robert Kieft and Lizanne Payne, “A Nation-Wide Planning Framework for Large-Scale Collaboration on Legacy Print Monograph Collections,” *Collaborative Librarianship* 2, no. 4 (2010): 229, <http://www.collaborativelibrarianship.org/index.php/joc/1/article/view/119/77> (accessed April 12, 2011).

⁶¹ Center for Research Libraries, “Print Archives and Preservation Registry (PAPR),” <http://www.crl.edu/node/7211> (accessed April 12, 2011); interview with Lizanne Payne of Center for Research Libraries, April 12, 2011.

⁶² Interview with Constance Malpas, Program Officer, OCLC Online Computer Library Center, April 20, 2011; OCLC Online Computer Library Center, “Cooperative Print Archiving,” <http://www.oclc.org/productworks/cooprintarchiving.htm> (accessed April 13, 2011).

⁶³ Library of Congress, Network Development and MARC Standards Office, “What Is a MARC Record and Why Is It So Important,” <http://www.loc.gov/marc/umb/um01to06.html#part5> (accessed April 15, 2011).

decisions). That particular data field can be used to record information about various details of preservation and digitization actions for particular titles and even specific copies of a title in a library's collection, including digital transformation, withdrawal from a collection, and transfer to an off-site storage facility.⁶⁴

Some observers have expressed concerns about this approach, particularly about the potential utility of the MARC 583 field to provide information about particular copies of journals and monographs.⁶⁵ MARC system specialists, however, have stated that the MARC 583 field can be used to record detailed information about archiving decisions for particular items and that the usefulness of the MARC system for archiving purposes rests with those who input the necessary data.⁶⁶

Beyond these two systems under development, two additional systems can be used to identify some types of redundant materials. OCLC has developed a prototype of its WorldCat Local system that enables libraries to archive or dispose of print items that are digitized in the HathiTrust digital repository. The WorldCat Local system is a single search engine that combines library consortia members' individual catalogs with their respective consortium's union catalog and WorldCat. The WorldCat Local prototype for the HathiTrust contains a database and data mining system that compare holdings listed in WorldCat with those listed in the HathiTrust digital archives. OCLC did not explicitly design this prototype system for de-duplication purposes, but the prototype has some features needed to do so. The system has the advantage of enabling libraries and institutions that are members of the HathiTrust to determine items in their holdings that are digitized in the HathiTrust and then archive print items. However, the system has two disadvantages: It is primarily helpful for archiving titles rather than for archiving particular volumes or editions, and it will not be supported by OCLC as other systems are developed.⁶⁷

⁶⁴ Library of Congress, Network Development and MARC Standards Office, "Preservation and Digitization Action: Terminology for MARC 21 Field 583," <http://www.loc.gov/marc/bibliographic/pda.pdf> (accessed April 15, 2011).

⁶⁵ Center for Research Libraries, "CRL Print Archives Network, Meeting with Consortium Partners, Monday February 22, 2010," 8; Center for Research Libraries, "CRL Print Archives Framework, Meeting with Consortium Partners, Friday March 26, 2010," 1, <http://www.crl.edu/sites/default/files/attachments/pages/CRL%20Print%20Archives%20meeting%202010%2003%2026.pdf> (accessed April 11, 2011).

⁶⁶ Interview with Rebecca Guenther, Senior Network and MARC Standards Specialist, Network Development and MARC Standards Office, Library of Congress, April 15, 2011.

⁶⁷ Center for Research Libraries, "CRL Print Archives Network, Meeting with Consortium Partners, Monday February 22, 2010," 9; Sue Polanka, "HathiTrust and OCLC Develop WorldCat Local Prototype," *No Shelf Required* [blog], <http://www.libraries.wright.edu/noshelfrequired/?p=1869> (accessed April 13, 2011); OCLC Online

ITHAKA has developed a prototype system called the Print Collections Decision Support Tool for journal archiving. The system is a spreadsheet that includes data on journals in the JSTOR database and allows users to perform queries on the data so that institutions can determine print copies of JSTOR journals that can be removed from their print collections. The system has the advantage of including information beyond that contained in MARC bibliographic records but suffers from a limited spreadsheet system and coverage of journals only in JSTOR.⁶⁸

ROLE OF DIGITAL REPOSITORIES IN THE OVERALL FEASIBILITY OF A FEDERAL LIBRARY CONSORTIUM

Digital Repositories

Digital repositories are collections of books, journals, maps, and other materials in digital format and accessible by computer. Sometimes called “digital libraries” or “virtual libraries,” digital repositories may contain both materials created in electronic format (“born digital”) and materials originally created in a physical form and later converted into electronic format (“digitized”). Those materials are either stored on on-site computers or on off-site, “remote” computers.

Digital repositories have some advantages over traditional libraries. For one, digital repositories are less costly to maintain than traditional libraries, because the per-item costs for digital storage are lower than those for print storage (less than 50 percent of print storage costs according to one estimate⁶⁹). Costs for utilizing digital repositories include digitization of

Computer Library Center, “WorldCat Local: Overview,” <http://www.oclc.org/worldcatlocal/overview/default.htm> (accessed April 13, 2011).

⁶⁸ ITHAKA, “Print Collections Decision-Support Tool,” <http://www.ithaka.org/ithaka-s-r/research/what-to-withdraw/print-collections-decision-support-tool> (accessed April 13, 2011); Center for Research Libraries, “CRL Print Archives Network, Meeting with Consortium Partners, Monday February 22, 2010,” 9–10.

⁶⁹ Paul N. Courant and Matthew Nielsen calculated the costs for storing print and electronic copies of books in perpetuity, and they estimated that the per-unit storage cost for electronic books was less than half that of print books. More specifically, Courant and Nielsen estimated circulation, construction, staffing, and other costs for storing books in perpetuity in different kinds of print storage facilities (open-stack, high-density, 10 years in open stack, remaining years in high density, etc) and various electronic storage scenarios (one fully mirrored digital archive, two such archives, black-and-white copies, full color, etc). Based on 2009 dollar values, their estimates for storing print books in perpetuity ranged from \$28.77 for solely high-density storage to \$141.89 for solely open-stack storage. Their estimates for electronic book storage ranged from \$5 for one fully mirrored digital archive with tape backup to \$13.10 for two fully mirrored digital archives and full color copies. See Paul N. Courant and Matthew Nielsen, “On the Cost of Keeping a Book,” in *The Idea of Order: Transforming Research Collections for 21st Century Scholarship* (Washington, DC: Council on Library and Information Resources, June 2010), 91–102, www.clir.org/pubs/reports/pub147/pub147.pdf (accessed March 22, 2011).

material (such as scanning books), and the costs of maintaining such repositories include electricity, rent, staff, and other costs that are also borne by traditional libraries. However, electronic materials require less physical storage space than do print materials; thus, repositories can store more materials in relatively less space than can traditional libraries. Digital materials are also relatively cheaper than print materials with regard to circulation, energy, maintenance, and staffing. In addition to their cost benefits, digital repositories have another advantage over traditional libraries in that they allow library users to more easily read and search books and other digitized materials. Moreover, single digital files, such as a digitized book, can be simultaneously used by more individuals than can single copies of print materials, such as a printed book, and can also act as preservation copies of print materials.⁷⁰

There are, however, some potential disadvantages in libraries' usage of digital repositories. For one, the costs of digital repositories may be in addition to the costs of maintaining print storage for a library that chooses to use both methods for storing materials. On the other hand, digital repository costs can replace print storage costs for a library that chooses to store materials as digital files rather than as print materials. A second potential disadvantage of digital repositories is that digital preservation is an endeavor that is in its formative stages, and thus the potential costs that libraries may expend on digital preservation are difficult to determine. However, the costs of electronic storage have declined over time, and the potential costs of not pursuing digital preservation are also uncertain and potentially high.⁷¹

Major Digital Repositories: The Internet Archive and the HathiTrust

Two prominent digital repositories are the Internet Archive and the HathiTrust. The Internet Archive is a San Francisco–based nonprofit organization that offers free, public access to electronic versions of items that users have uploaded to the site and that the organization itself has digitized. The repository's collection is partially backed up (or “mirrored”) at various locations in the United States and at Egypt's Bibliotheca Alexandrina, and the collection's digitized copies of film, music, and print materials are either in the public domain or have been uploaded by individuals holding rights to the uploaded material. As of April 2011, the largest component of the Internet Archive was nearly 150 billion archived Web sites, and the site also

⁷⁰ Courant and Nielsen, “On the Cost of Keeping a Book,” 99–102.

⁷¹ Tyler O. Walters and Katherine Skinner, “Economics, Sustainability, and the Cooperative Model in Digital Preservation,” *Library Hi Tech* 28, no. 2 (2010): 263–64.

contained 2.8 million digitized books, journals, and other text items. The repository's archives of texts and Web sites can be accessed through links in records in local library catalogs, but the site's search capabilities are somewhat cumbersome and nonintuitive.⁷²

Another digital repository is the HathiTrust, which several American universities founded in 2008 to function as a secure and comprehensive archive of digitized materials uploaded by and/or accessible to institutions that pay membership fees based on the manner and extent to which institutions use the site. By April 2011, the organization's membership consisted of 52 institutions, including the Committee on Institutional Cooperation, which encompasses the Big Ten universities and the University of Chicago; Ivy League universities; the Library of Congress, and the New York Public Library. The repository's digital files are stored at the University of Michigan, and the University of Indiana mirrors the repository's content. CRL completed a preservation audit of the HathiTrust in December 2010 and was generally positive about the organization's practices and services, including its technical infrastructure and security. CRL has not conducted a similar audit of the Internet Archive.⁷³

The HathiTrust's collection of digital material grew from nearly 1 million digitized volumes in March 2008 to 8.5 million digitized volumes in April 2011. Those 8.5 million volumes included 4.7 million book titles and 206,000 serial titles, and nearly 26 percent of the total volumes were in the public domain. A member institution's patrons can access the full text of public-domain items and non-public-domain materials that the member institution itself has uploaded, but patrons can only access materials through the member institution's own Internet servers or on-site computers.⁷⁴ According to John Wilkin, Executive Director of the HathiTrust, the most significant handicap the organization faces is Section 108 of U.S. copyright law (United States Code, Title 17, Section 108) because as a consequence of this law, public access is

⁷² Internet Archive, "Frequently Asked Questions," http://www.archive.org/about/faqs.php#Uploading_Content (accessed April 24, 2011); Internet Archive, "Frequently Asked Questions," <http://www.archive.org/about/faqs.php> (accessed May 2, 2011); Internet Archive, "Advanced Search," <http://www.archive.org/advancedsearch.php> (accessed April 24, 2011); Internet Archive, "Using the Internet Archive," <http://www.archive.org/about/using.php> (accessed April 24, 2011).

⁷³ HathiTrust, "Mission and Goals," http://www.hathitrust.org/mission_goals (accessed March 31, 2011); HathiTrust, "Partnership Community," <http://www.hathitrust.org/community> (accessed April 13, 2011); HathiTrust, "Getting Content into HathiTrust," <http://www.hathitrust.org/ingest> (accessed April 13, 2011); Center for Research Libraries, "Certification Report on the HathiTrust Digital Repository," http://www.crl.edu/sites/default/files/attachments/pages/CRL%20HathiTrust%202011_final.pdf (accessed April 24, 2011).

⁷⁴ HathiTrust, "Update on March 2008 Activities," http://www.hathitrust.org/updates_march2008 (accessed April 21, 2011); HathiTrust, "Statistics Information," http://www.hathitrust.org/statistics_info (accessed April 13, 2011).

restricted to only 26 percent of the collection.⁷⁵ Wilkin is interested in expanding fair-use eligibility. In 2005 the Library of Congress, National Digital Information Infrastructure and Preservation Program (NDIIP), and the U.S. Copyright Office convened the Section 108 Study Group “for the purpose of reexamining the copyright exceptions and limitations applicable to libraries and archives under the Copyright Act in light of the widespread use of digital technologies,” and tasked the Group to recommend legislative amendments to the law.⁷⁶

HathiTrust partners are charged “general costs” or infrastructural costs (servers, tape backup, etc) for the content they deposit and a one-time fee each year that they deposit new content to the repository. The HathiTrust has an on-line calculator for estimating these costs. According to the HathiTrust, the organization’s 8.5 million digitized volumes take up 378 terabytes, or 381,000 GB, for a 0.4 GB per volume, and Library of Congress estimates of GB per volume are lower, at 0.2 GB per volume.⁷⁷ Based on the HathiTrust’s on-line cost calculator and LC’s estimate of 0.2 GB per volume, an institution could deposit 10,000 volumes (roughly equivalent to 2,000 GB) for nearly \$7,000 for the five-year period from 2010 to 2014 or 100,000 volumes (around 20,000 GB) for around \$70,000 in the same period.

The Potential Role of a Digital Repository in a Federal Library Consortium

The potential role of a digital repository in a federal library consortium is that it can help federal libraries relieve crowding in their on-site holding facilities and expand their patrons’ access to collections available on the repository. Libraries can relieve overcrowding in their physical holdings by digitizing materials in their collections, storing the digital copies on a digital repository, and archiving physical copies of digitized items. Libraries such as the Library

⁷⁵ The right of reproduction under this section applies to three copies or phonorecords of a published work duplicated solely for the purpose of replacement of a copy or phonorecord that is damaged, deteriorating, lost, or stolen, or if the existing format in which the work is stored has become obsolete, if—

- (1) the library or archives has, after a reasonable effort, determined that an unused replacement cannot be obtained at a fair price; and
- (2) any such copy or phonorecord that is reproduced in digital format is not made available to the public in that format outside the premises of the library or archives in lawful possession of such copy.

For such purposes of this subsection, a format shall be considered obsolete if the machine or device necessary to render perceptible a work stored in that format is no longer manufactured or is no longer reasonably available in the commercial marketplace.

⁷⁶ U.S. Copyright Office and Library of Congress, National Digital Information Infrastructure and Preservation Program, “The Section 108 Study Group Report,” March 2008, <http://www.section108.gov/docs/Sec108StudyGroupReport.pdf> (accessed April 5, 2011).

of Congress have used the HathiTrust to store digital copies of materials that they have digitized and transferred the print copies of those materials to off-site storage.⁷⁸

Libraries can also compare their print holdings with electronic materials on digital repositories and then archive print materials that are accessible as full-text files through those repositories. By using a digital repository in this way, federal libraries benefit from the costs that other institutions have paid to digitize materials and store them on a digital repository. For example, in December 2010 the Library of Congress identified more than 800,000 public-domain print items that were available as digital files on the HathiTrust Web site—far exceeding an estimated 300,000 overflow print items in the Library of Congress collection at that time—and is considering the removal of those items to off-site storage. Because the HathiTrust’s collection has experienced substantial growth, the Library plans to continue identifying overlaps between its print collections and public-domain materials available on the HathiTrust so that the Library of Congress can continue to transfer print copies of digitized items to off-site storage.⁷⁹

In addition to relieving overcrowding in their print holdings, federal libraries can also use a digital repository to expand the materials that are available to their patrons. Through participation in a digital repository, libraries can provide their patrons with access to public-domain materials without bearing the costs of purchasing, processing, and storing print copies of those items.

An additional advantage for federal libraries’ potential use of digital repositories is that there are few barriers to such usage. The Internet Archive charges no fees for its services, and federal libraries may soon be able to use the HathiTrust without signing their own individual agreement with the repository. This access is possible because the Federal Library and Information Network (FEDLINK) is working on a contract with the HathiTrust that will allow

⁷⁷ HathiTrust, “Cost,” <http://www.hathitrust.org/cost> (accessed March 31, 2011); HathiTrust, “Home,” <http://www.hathitrust.org/> (accessed April 13, 2011); Library of Congress–HathiTrust Agreement, Library of Congress contract number LCLSM11C0004, October 29, 2010, 2.

⁷⁸ Interview with Michael Handy, Deputy Associate Librarian of Library Services, Library of Congress, and Aaron Chaletzky, Digital Library Specialist, Library of Congress, April 8, 2011; interview with John Wilkin, Executive Director, HathiTrust, April 20, 2011.

⁷⁹ Interview with Ronald B. Roache, Supervisory Librarian, Collections Access, Loan, and Management Division, Library of Congress, April 20, 2011; interview with Michael Handy, Deputy Associate Librarian of Library Services, Library of Congress, and Aaron Chaletzky, Digital Library Specialist, Library of Congress, April 8, 2011. LC identified the items held in both the HathiTrust and the Library’s own collection by downloading holdings data from the HathiTrust into Microsoft Excel and then used Visual Basic to analyze that data. Interview with David Williamson, Cataloging Automation Specialist, Acquisitions and Bibliographic Access Directorate, Library of Congress, April 19, 2011.

any member of FEDLINK to store digital material in the HathiTrust without engaging in a separate contractual agreement.⁸⁰

However, there are some potential disadvantages for libraries in using a digital repository to relieve overcrowding in on-site holdings and expand their collections. The extent to which any library can use a digital repository for these purposes depends heavily on the extent to which a digital repository's holdings match the library's collection and serve the needs of a library's patrons. Most material on the Internet Archive is not likely to support the research interests of federal libraries' users, as the site was not established to support research but rather to archive the Internet, as its extensive Web archive attests.

The HathiTrust was established by universities to support their patrons' research needs, but the majority of the site's 8.5 million items (76 percent as of April 2011) are not in the public domain and are not accessible as full-text documents to libraries that have not uploaded those materials to the repository.⁸¹ In addition, one possible limit on the HathiTrust's usefulness for libraries concerns the age of public-domain material on the site: Most of the monographs that are accessible as full-text documents on the HathiTrust site were published before 1964. Another possible problem with the HathiTrust's possible usefulness for federal libraries concerns the subjects that are most available on the site. More than half of full-text titles on the HathiTrust were government documents or concerned with humanities subjects, such as history, language, literature, and philosophy.⁸²

These are, however, *potential* disadvantages. The above statistics for these digital repositories are aggregate statistics, and there is likely to be substantial variance among federal libraries in the research interests of their patrons and in the age and subjects of the materials of their collections. Thus, the extent to which federal libraries may find a digital repository useful

⁸⁰ Interview with Michael Handy, Deputy Associate Librarian of Library Services, Library of Congress, and Aaron Chaletzky, Digital Library Specialist, Library of Congress, April 8, 2011.

⁸¹ HathiTrust, "Home," <http://www.hathitrust.org/> (accessed April 13, 2011); Lyrasis and Institute of Museum and Library Services, "Developing a North American Strategy To Preserve and Manage Print Collections of Monographs, Agenda for the Workshop, October 27–28, 2010, Chicago, Illinois" (unpublished paper, Atlanta, GA), 1.

⁸² Constance Malpas, "Cloud-Sourcing Research Collections: Managing Print in the Mass-Digitized Library Environment" (Dublin, OH: OCLC Online Computer Research Center, January 2011): 17–26, <http://www.oclc.org/research/publications/library/2011/2011-01.pdf> (accessed April 7, 2011); John P. Wilkin, "Bibliographic Indeterminacy and the Scale of Problems and Opportunities of 'Rights' in Digital Collection Building" (Washington, DC: Council on Library and Information Services, February 2011), <http://www.clir.org/pubs/ruminations/01wilkin/wilkin.pdf> (accessed April 20, 2011).

for realizing the abovementioned benefits will likely vary with the extent to which that repositories' holdings mirror an individual library's holdings and patron needs.

ISSUES TO BE CONSIDERED

Should federal libraries enter into a cooperative agreement to share an environmentally controlled, off-site storage facility, or, based on the considerations addressed by Yale University, each establish their own off-site storage annex?

If federal libraries opt to form a consortium, the following issues should be addressed:

- *Overall Mission*
 - What is the purpose of the consortium, and what would be the level of service? Should it be a “dark archive,” where low-use, difficult-to-replace materials are stored with little or no access? Should a portion of the shared collection be made available to member institutions, leaving other materials as “dark”? Should the entire collection be available to member institutions? Would institutions collectively or individually own the contents of the storage facility? Would it be a shared storage facility, or a shared archive (with a commitment to share the collection for a specified period of time)?
- *Governance*
 - For purposes of decision-making and conflict mediation, members could establish a Board of Governors, or other directorate, as well as a Preservation Committee. Members would need to decide how a board and/or committees are selected, and whether member institutions with larger collections have dominant control. Members also need to determine how costs would be shared.
- *Criteria for Selection and Common Cataloging Tool*
 - Members would need to determine whether WorldCat would be used for collection analysis or if a new shared catalog would have to be established (e.g., WRLC's ALADIN). Members would need to evaluate the use of digital repositories as an adjunct to, or replacement for, a storage facility, including which institution makes the digital copies.
- *Validation Process*
 - Members would need to determine how thoroughly materials for the shared facility will be evaluated for their condition and content; e.g., does the cost of inspecting each page of materials exceed the benefit, or should a more random approach be adopted?

- *Use of Existing Storage Facilities*
 - Members would need to evaluate the potential of underground facilities operated by NARA. If one library, e.g., the Library of Congress, contracts with NARA for storage of materials at a NARA facility, could other libraries in the consortium share the space? Would federal libraries consider sharing the cost to build additional modules at Fort Meade? (Would the law that transferred the land to the Library allow this cost sharing?)

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The researchers also conducted interviews with the heads of various high-density library storage facilities, Library of Congress officials, and other experts. The sources were as follows:

Aaron Chaletzky, Digital Library Specialist, Library of Congress

Michael DiMassa, Director, Yale University Library Shelving Facility

Paul Frank, Cooperative Cataloging Program Specialist for Cooperative and Instructional Programs Division, Library of Congress

Rebecca Guenther, Senior Network and MARC Standards Specialist, Network Development and MARC Standards Office, Library of Congress

Michael Handy, Deputy Associate Librarian of Library Services, Library of Congress

Eileen Henthorne, Executive Director, Research Collections and Preservation Consortium (ReCAP)

Steven J. Herman, Chief of Collections Access, Loan Management Division (CALM), Library of Congress

Mark Jacobs, Director, and Bruce Hulse, Director of Information Services, Washington Research Library Consortium (WRLC), Upper Marlboro, Maryland

Kathryn Leigh, Head, Access Services, University of Massachusetts at Amherst Library

Constance Malpas, Program Officer, OCLC Online Computer Library Center

Ron Mitchell, National Accounts Manager for NARA Federal Records Center

Lizanne Payne, Print Archives Program Manager, Center for Research Libraries

Ronald B. Roache, Collections Access, Loan Management Division (CALM), Library of Congress

Jay Schafer, Director of Libraries, University of Massachusetts at Amherst

Matthew Sheehy, Assistant Director of the Harvard University Library for the Harvard Depository

Emily Stambaugh, Shared Print Manager, California Digital Library, UC Office of the President

Carolyn Sturtevant, BIBCO Coordinator Cooperative and Instructional Programs Division, Library of Congress

Beacher Wiggins, Director, Acquisitions and Bibliographic Access, Library of Congress

John Wilkin, Executive Director, Hathi Trust, and Associate University Librarian for Library Information Technology at the University of Michigan

David Williamson, Cataloging Automation Specialist, Acquisitions and Bibliographic Access
Directorate, Library of Congress

APPENDIX 1: RECOMMENDED STANDARDS CHART

National Archives and Records Administration

§ 1234.34

a carton at floor level. Assumptions must be noted in the report;

(1) Details the characteristics of the system; and

(1i) Describes the specific measures beyond the minimum features required by the applicable building code that have been incorporated to limit destruction of records. The report should make specific references to industry standards used in the design, such as those issued by the National Fire Protection Association, and any testing or modeling or other sources used in the design.

(b) *NARA action.* (1) NARA will approve the fire-safety detection and suppression system within 10 work days if NARA has previously approved the system design for similarly configured space or if a report of independent testing of a new system design is furnished as documentation.

(2) If, in NARA's judgment, the supporting documentation provided in accordance with paragraph (a)(3) of this section clearly demonstrates compliance with §1234.12(s), NARA will approve the fire-safety detection and suppression system within 30 calendar days.

(3) If NARA questions whether supporting documentation demonstrates compliance with §1234.12(s), NARA will consult the appropriate industry standards body or other qualified expert before making a determination. Before any consultation, NARA may ask the agency for additional clarifying information. NARA will notify the requesting agency within 30 calendar days of receipt of the request that consultation is necessary and will provide a final determination within 60 calendar days. If NARA does not approve the system,

NARA will furnish a full explanation of the reasons for its decision.

(4) NARA will maintain a list of approved alternative systems.

§ 1234.34 When may NARA conduct an inspection of a records storage facility?

(a) At the time an agency submits a request to establish an agency records center, pursuant to §1234.30, NARA may conduct an inspection of the proposed facility to ensure that the facility complies fully with the standards in this subpart. NARA may also conduct periodic inspections of agency records centers so long as such facility is used as an agency records center. NARA will inspect its own records center facilities on a periodic basis to ensure that they are in compliance with the requirements of this subpart.

(b) Agencies must ensure, by contract or otherwise, that agency and NARA officials, or their delegates, have the right to inspect commercial records storage facilities to ensure that such facilities fully comply with the standards in this subpart. NARA may conduct periodic inspections of commercial records storage facilities so long as agencies use such facilities to store agency records. The using agency, not NARA, will be responsible for paying any fee or charge assessed by the commercial records storage facility for NARA's conducting an inspection.

(c) NARA will contact the agency operating the records center or the agency holding a contract with a commercial records storage facility in advance to set a date for the inspection.

APPENDIX A TO PART 1234—MINIMUM SECURITY STANDARDS FOR LEVEL III FEDERAL FACILITIES

RECOMMENDED STANDARDS CHART

[Reproduced from Section 2.3 (pp. 2-6 through 2-9) of U.S. Department of Justice, United States Marshals Service report *Vulnerability Assessment of Federal Facilities*]

		Level III
Perimeter Security		
<i>Parking:</i>		
Control of facility parking		Required.
Control of adjacent parking		Desirable.
Avoid leases where parking cannot be controlled		Desirable.
Leases should provide security control for adjacent parking		Desirable.
Post signs and arrange for towing unauthorized vehicles		Required.
ID system and procedures for authorized parking (placard, decal, card key, etc.)		Required.
Adequate lighting for parking areas		Required.

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RECOMMENDED STANDARDS CHART—Continued

[Reproduced from Section 2.3 (pp. 2–6 through 2–9) of U.S. Department of Justice, United States Marshals Service report *Vulnerability Assessment of Federal Facilities*]

	Level III
<i>Closed Circuit Television (CCTV) Monitoring:</i>	
CCTV surveillance cameras with time lapse video recording	Recommended.
Post signs advising of 24 hour video surveillance	Recommended.
<i>Lighting:</i>	
Lighting with emergency power backup	Required.
<i>Physical Barriers:</i>	
Extend physical perimeter with barriers (concrete and/or steel composition)	Desirable.
Parking barriers	Desirable.
Entry Security	
<i>Receiving/Shipping:</i>	
Review receiving/shipping procedures (current)	Required.
Implement receiving/shipping procedures (modified)	Required.
<i>Access Control:</i>	
Evaluate facility for security guard requirements	Required.
Security guard patrol	Recommended.
Intrusion detection system with central monitoring capability	Required.
Upgrade to current life safety standards (fire detection, fire suppression systems, etc.)	Required.
<i>Entrances/Exits:</i>	
X-ray & magnetometer at public entrances	Recommended.
Require x-ray screening of all mail/packages	Recommended.
High security locks	Required.
Interior Security	
<i>Employee/Visitor Identification:</i>	
Agency photo ID for all personnel displayed at all times	Recommended.
Visitor control/screening system	Required.
Visitor identification accountability system	Recommended.
Establish ID issuing authority	Recommended.
<i>Utilities:</i>	
Prevent unauthorized access to utility areas	Required.
Provide emergency power to critical systems (alarm systems, radio communications, computer facilities, etc.)	Required.
<i>Occupant Emergency Plans:</i>	
Examine occupant emergency plans (OEP) and contingency procedures based on threats	Required.
OEPs in place, updated annually, periodic testing exercise	Required.
Assign & train OEP officials (assignment based on largest tenant in facility)	Required.
Annual tenant training	Required.
<i>Daycare Centers:</i>	
Evaluate whether to locate daycare facilities in buildings with high threat activities	Required.
Compare feasibility of locating daycare in outside locations	Required.
Security Planning	
<i>Intelligence Sharing:</i>	
Establish law enforcement agency/security liaisons	Required.
Review/establish procedure for intelligence receipt/dissemination	Required.
Establish uniform security/threat nomenclature	Required.
<i>Training:</i>	
Conduct annual security awareness training	Required.
Establish standardized unarmed guard qualifications/training requirements	Required.
Establish standardized armed guard qualifications/training requirements	Required.
<i>Tenant Assignment:</i>	
Co-locate agencies with similar security needs	Desirable.
Do not co-locate high/low risk agencies	Desirable.
<i>Administrative Procedures:</i>	
Establish flexible work schedule in high threat/high risk areas to minimize employee vulnerability to criminal activity	Desirable.
Arrange for employee parking in/ear building after normal work hours	Recommended.
Conduct background security checks and/or establish security control procedures for service contract personnel	Required.
<i>Construction/Renovation:</i>	
Install mylar film on all exterior windows (shatter protection)	Recommended.
Review current projects for blast standards	Required.
Review/establish uniform standards for construction	Required.
Review/establish new design standard for blast resistance	Required.
Establish street set-back for new construction	Recommended.

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TERMS AND DEFINITIONS IN RECOMMENDED STANDARDS CHART

[Reproduced from Appendix B, Details of Recommended Security Standards, U.S. Department of Justice, United States Marshals Service report *Vulnerability Assessment of Federal Facilities*]

Term	Definition/description
B.1 Perimeter Security	
Parking	
Control of Facility Parking	Access to government parking should be limited where possible to government vehicles and personnel. At a minimum, authorized parking spaces and vehicles should be assigned and identified.
Control of Adjacent Parking	Where feasible, parking areas adjacent to federal space should also be controlled to reduce the potential for threats against Federal facilities and employee exposure to criminal activity.
Avoid Leases Where Parking Cannot Be Controlled.	Avoid leasing facilities where parking cannot be controlled. If necessary, relocate offices to facilities that do provide added security through regulated parking.
Lease Should Provide Control for Adjacent Parking.	Endeavor to negotiate guard services as part of lease.
Post Signs and Arrange for Towing Unauthorized Vehicles.	Procedures should be established and implemented to alert the public to towing policies, and the removal of unauthorized vehicles.
ID System and Procedures for Authorized Parking.	Procedures should be established for identifying vehicles and corresponding parking spaces (placard, decal, card key, etc.)
Adequate Lighting for Parking Areas	Effective lighting provides added safety for employees and deters illegal or threatening activities.
Closed circuit television (CCTV) monitoring	
CCTV Surveillance Cameras With Time Lapse Video Recording.	Twenty-four hour CCTV surveillance and recording is desirable at all locations as a deterrent. Requirements will depend on assessment of the security level for each facility. Time-lapse video recordings are also highly valuable as a source of evidence and investigative leads.
Post Signs Advising of 24 Hour Video Surveillance.	Warning signs advising of twenty-four hour surveillance act as a deterrent in protecting employees and facilities.
Lighting	
Lighting with Emergency Power Backup	Standard safety code requirement in virtually all areas. Provides for safe evacuation of buildings in case of natural disaster, power outage, or criminal/terrorist activity.
Physical Barriers	
Extend Physical Perimeter, With Barriers ...	This security measure will only be possible in locations where the Government controls the property and where physical constraints are not present. (barriers of concrete and/or steel composition)
Parking Barriers	Desirable to prevent unauthorized vehicle access.
B.2 Entry Security	
Receiving/Shipping	
Review Receiving/Shipping Procedures (Current).	Audit current standards for package entry and suggest ways to enhance security.
Implement Receiving/Shipping Procedures (Modified).	After auditing procedures for receiving/shipping, implement improved procedures for security enhancements.
Access Control	
Evaluate Facility for Security Guard Requirements.	If security guards are required, the number of guards at any given time will depend on the size of the facility, the hours of operation, and current risk factors, etc.
Security Guard Patrol	Desirable for level I and II facilities and may be included as lease option. Level III, IV and V facilities will have security guard patrol based on facility evaluation.
Intrusion Detection System With Central Monitoring Capability.	Desirable in Level I facilities, based on evaluation for Level II facilities, and required for Levels III, IV and V.
Upgrade to Current Life Safety Standards	Required for all facilities as part of GSA design requirements, (e.g. fire detection, fire suppression systems, etc.)
Entrances/Exits	
X-Ray and Magnetometer at Public Entrances.	May be impractical for Level I and II facilities. Level III and IV evaluations would focus on tenant agencies, public interface, and feasibility. Required for Level V.
Require X-Ray Screening of all Mail/Packages.	All packages entering building should be subject to x-ray screening and/or visual inspection.

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TERMS AND DEFINITIONS IN RECOMMENDED STANDARDS CHART—Continued

[Reproduced from Appendix B, Details of Recommended Security Standards, U.S. Department of Justice, United States Marshals Service report *Vulnerability Assessment of Federal Facilities*]

Term	Definition/description
High Security Locks	Any exterior entrance should have a high security lock as determined by GSA specifications and/or agency requirements.
B.3 Interior Security	
Employee/Visitor Identification	
Agency Photo ID for all Personnel Displayed At All Times.	May not be required in smaller facilities.
Visitor Control/Security System	Visitors should be readily apparent in Level I facilities. Other facilities may ask visitors to sign-in with a receptionist or guard, or require an escort, or formal identification/badge.
Visitor Id Accountability System	Stringent methods of control over visitor badges will ensure that visitors wearing badges have been screened and are authorized to be at the facility during the appropriate time frame.
Establish Id Issuing Authority	Develop procedures and establish authority for issuing employee and visitor IDs.
Utilities	
Prevent Unauthorized Access to Utility Areas.	Smaller facilities may not have control over utility access, or locations of utility areas. Where possible, assure that utility areas are secure and that only authorized personnel can gain entry.
Provide Emergency Power To Critical Systems.	Tenant agency is responsible for determining which computer and communication systems require back-up power. All alarm systems, CCTV monitoring devices, fire detection systems, entry control devices, etc. require emergency power sources. (Alarm Systems, Radio Communications, Computer Facilities, Etc.)
Occupant Emergency Plans	
Examine Occupant Emergency Plan (OEP) and Contingency Procedures Based on Threats.	Review and update current OEP procedures for thoroughness. OEPs should reflect the current security climate.
Assign and Train OEP Officials	Assignment based on GSA requirement that largest tenant in facility maintain OEP responsibility. Officials should be assigned, trained and a contingency plan established to provide for the possible absence of OEP officials in the event of emergency activation of the OEP.
Annual Tenant Training	All tenants should be aware of their individual responsibilities in an emergency situation.
Day Care Center	
Re-Evaluate Current Security and Safety Standards.	Conduct a thorough review of security and safety standards.
Assess Feasibility of Locating Day Care Within Federal Facility.	If a facility is being considered for a day care center, an evaluation should be made based on the risk factors associated with tenants and the location of the facility.
B.4 Security Planning	
Intelligence Sharing	
Establish Law Enforcement Agency/Security Liaisons.	Intelligence sharing between law enforcement agencies and security organizations should be established in order to facilitate the accurate flow of timely and relevant information between appropriate government agencies. Agencies involved in providing security must be part of the complete intelligence process.
Review/Establish Procedures for Intelligence Receipt/Dissemination.	Determine what procedures exist to ensure timely delivery of critical intelligence. Review and improve procedures to alert agencies and specific targets of criminal/terrorist threats. Establish standard administrative procedures for response to incoming alerts. Review flow of information for effectiveness and time critical dissemination.
Establish Uniform Security/Threat Nomenclature.	To facilitate communication, standardized terminology for Alert Levels should be implemented. (Normal, Low, Moderate, and High—As recommended by Security Standards Committee)
Training	
Conduct Annual Security Awareness Training.	Provide security awareness training for all tenants. At a minimum, self-study programs utilizing videos, and literature, etc. should be implemented. These materials should provide up-to-date information covering security practices, employee security awareness, and personal safety, etc.

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TERMS AND DEFINITIONS IN RECOMMENDED STANDARDS CHART—Continued

[Reproduced from Appendix B, Details of Recommended Security Standards, U.S. Department of Justice, United States Marshals Service report *Vulnerability Assessment of Federal Facilities*]

Term	Definition/description
Establish Standardized Armed And Unarmed Guard Qualifications/Training Requirements.	Requirements for these positions should be standardized government wide.
Tenant Assignment	
Co-Locate Agencies With Similar Security Needs. Do Not Co-Locate High/Low Risk Agencies	To capitalize on efficiencies and economies, agencies with like security requirements should be located in the same facility if possible. Low risk agencies should not take on additional risk by being located with high risk agencies.
Administrative Procedures	
Establish Flexible Work Schedule in High Threat/High Risk Area to Minimize Employee Vulnerability to Criminal Activity. Arrange for Employee Parking In/Near Building After Normal Work Hours. Conduct Background Security Checks and/ or Establish Security Control Procedures for Service Contract Personnel.	Flexible work schedules can enhance employee safety by staggering reporting and departure times. As an example flexible schedules might enable employees to park closer to the facility by reducing the demand for parking at peak times of the day. Minimize exposure to criminal activity by allowing employees to park at or inside the building. Establish procedures to ensure security where private contract personnel are concerned. Procedures may be as simple as observation or could include sign-in/escort. Frequent visitors may necessitate a background check with contractor ID issued.
Construction/Renovation	
Install Mylar Film on All Exterior Windows (Shatter Protection). Review Current Projects For Blast Standards. Review/Establish Uniform Standards For Construction. Review/Establish New Design Standard for Blast RESISTANCE. Establish Street Set-Back for New Construction.	Application of shatter resistant material to protect personnel and citizens from the hazards of flying glass as a result of impact or explosion. Design and construction projects should be reviewed if possible, to incorporate current technology and blast standards. Immediate review of ongoing projects may generate savings in the implementation of upgrading to higher blast standards prior to completion of construction. Review, establish, and implement uniform construction standards as it relates to security considerations. In smaller facilities or those that lease space, control over design standards may not be possible. However, future site selections should attempt to locate in facilities that do meet standards. New construction of government controlled facilities should review, establish, and implement new design standards for blast resistance. Every foot between a potential bomb and a building will dramatically reduce damage and increase the survival rate. Street set-back is always desirable, but should be used in conjunction with barriers in Level IV and V facilities.
(Reproduced from Appendix C, <i>Classification Table</i> , U.S. Department of Justice, United States Marshals Service report <i>Vulnerability Assessment of Federal Facilities</i>)	
Level	Typical location
III	Agency Mix: Government Records.

APPENDIX B TO PART 1234—ALTERNATIVE CERTIFIED FIRE-SAFETY DETECTION AND SUPPRESSION SYSTEM(S)

1. *General.* This Appendix B contains information on the Fire-safety Detection and Suppression System(s) tested by NARA through independent live fire testing that are certified to meet the requirement in §1234.12(s) for storage of Federal Records. Use of a system specified in this appendix is optional. A facility may choose to have an alternate fire-safety detection and suppression system approved under §1234.32).

2. *Specifications for NARA facilities using 15 foot high records storage.* NARA fire-safety systems that incorporate all components specified in paragraphs 2.a. through n. of this appendix have been tested and certified to meet the requirements in §1234.12(s) for an acceptable fire-safety detection and suppression system for storage of Federal records.
 a. The records storage height must not exceed the nominal 15 feet (±3 inches) records storage height.
 b. All records storage and adjoining areas must be protected by automatic wet-pipe

APPENDIX 2: SURVEY QUESTIONS AND RESPONSES**Federal Agencies Contacted for this Report's Survey**

Administrative Office of the U.S. Courts	National Oceanic and Atmospheric Administration
Air Force Historical Studies Office	National Research Council
Army Center of Military History	National Security Agency
Army Corps of Engineers	National Science Foundation
Board of Governors of the Federal Reserve System	National Technical Information Service
Commodity Futures Trading Commission	Office of Naval Intelligence
Consumer Product Safety Commission	Office of Thrift Supervision
Defense Acquisition University	Overseas Private Investment Corporation
Defense Intelligence Agency	Securities and Exchange Commission
Defense Technical Information Center	Smithsonian Institution
Department of Agriculture	Social Security Administration
Department of the Army	United States Agency for International Development
Department of Commerce	United States Environmental Protection Agency
Department of Defense	United States Equal Employment Opportunity Commission
Department of Education	United States Fish and Wildlife Service
Department of Energy	United States Geological Survey
Department of Health and Human Services	United States Government Accountability Office
Department of Housing and Urban Development	United States Government Printing Office
Department of the Interior	United States Patent and Trademark Office
Department of Labor	United States Peace Corps
Department of the Navy	United States Tax Court
Department of State	
Department of Transportation	
Department of the Treasury	
Federal Bureau of Investigation	
Federal Communications Commission	
Federal Deposit Insurance Corporation	
Federal Election Commission	
Federal Energy Regulatory Commission	
Federal Maritime Commission	
Federal Trade Commission	
Food and Drug Administration	
Internal Revenue Service	
Library of the Marine Corps	
Marine Corps War College	
National Gallery of Art	
National Institute of Standards and Technology	
National Labor Relations Board	

Text of the Survey Sent to the Federal Agencies Listed Above

Dear Federal Librarian:

As background for a feasibility study the Federal Research Division, Library of Congress, is currently preparing on behalf of FLICC, we are reaching out to various federal and military libraries. We are inquiring about respective storage needs and gauging interest in forming a library consortium for the purpose of jointly storing print materials (not records storage). We are seeking your input for informational purposes only. Any information shared with us will not be attributed to any one institution in our report.

- 1) Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?
- 2) If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?
- 3) Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?
- 4) Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?
- 5) Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?

Summary of Survey Responses

(More detailed responses from some survey respondents are provided on the following pages.)

<i>Response</i>	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>
Yes	10 (53%)	10 (53%)	5 (50%)	6 (60%)	8 (80%)
No	9 (47%)	0	4 (40%)	3 (30%)	2 (20%)
Yes and No	0	0	1 (10%)	1 (10%)	0

Total number of responses: 19.
Q2-Q5 percentages based on the number of “yes” responses to Q1.
Survey conducted in two stages during May and June–July 2011.

Detailed Survey Responses

Respondent 1

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes, we are quickly running out of space, necessitating the possible acquisition or rental of additional storage space.

- 2) *If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*

Yes, we would be interested in forming such a consortium.

- 3) *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*

Some already are, and some probably will be in the future.

- 4) *Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?*

Yes, some are rare and difficult to replace. We would be interested in some restrictions to their use.

- 5) *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*

Circulation should still be limited to members of our institution.

Respondent 3

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes.

- 2) *If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*

Yes, we have approximately 600,000 volumes, primarily serials runs that we would be interested in potentially storing off-site in a pooled resource center.

- 3) *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*

Many of them are but not everything. Some of the materials could be digitized but are not currently a part of our long-term plan for digitization. Those materials are primarily older materials published either by foreign entities or by other Federal Departments.

- 4) *Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a "dark archive," which would place significant restrictions on use and circulation?*

Yes, some of the materials are rare and would be difficult to replace, but no, we would not necessarily be interested in placing the materials in a "dark archive." Our mission is not one of preservation at any cost but of access for research needs.

- 5) *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*

Yes, if the circulation could be monitored and controlled and if penalties were enforced for loss or damage, we would be willing to share our materials. We would prefer that if the materials were circulated, we receive information on usage in order to prioritize future digitization.

Even though you did not ask, I should mention that while everything we store will have a bibliographic record, there will not be analytic or item records for everything. Many of our serials records are inadequate for describing the number of items, their scope and content. Many remote storage facilities require that there be a separate barcode (or RFID label) for every piece. To accomplish this, we would have to do an extensive retrospective conversion on the materials being sent. I am pretty sure that we aren't the only facility that would struggle with this issue.

Respondent 4

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes.

- 2) *If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*

Yes, the [federal agency] would be interested in joining with LC and others to share off-site storage.

<u>Current Collection</u>	<u>Potential for Storage</u>
Monographs, 100,982	30,000 to 45,000
Journals (paper), unknown	?
ERIC microfiche, 14 cabinets (10 drawers each)	14 cabinets

- 3) *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*

Some are in digital format now, for example, the ERIC microfiche; others will be digitized in the near future (within the next five years).

- 4) *Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?*

Yes, some would need to be placed in a dark archive.

- 5) *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*

Yes, we would be willing to circulate items not placed in the dark archive.

Respondent 5

At present the [federal agency] is not facing collection capacity issues.

Respondent 6

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

No, not for book or journal material. For our archival materials, we use the Federal Records Center, and this is paid for by [federal agency].

Respondent 8

1. *Is your Library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes, we are faced with making such decisions.

2. *Of the answer to (1) is yes, would your library be interested on joining the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*
 - a. Yes, we must take into account the commitment of funds and time and requirements involved in managing the off-site.
 - b. Our collection is composed of 181,000 items, including [name of specific collection of federal agency], the Folio collection [subject material], and a 30,000-volume [subject material] collection.
 - c. We would be interested in housing 150–200 odd-sized titles from the Folio collection, if the storage [were] environmentally friendly to older documents and if we would be able to retrieve items with in a reasonable length of time.
3. *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*
 - a. Some of the materials we would store are available currently in digital format, but only a small percentage. We would like to have access to our stored collection so that we can continue to digitize our rare and fragile holdings.
4. *Are any of these materials rare or difficult to replace? If yes, would your library be interested storing materials in a “dark archive,” which would place significant restrictions on use and circulation?*
 - a. Yes. Many of the union newspapers would be impossible to replace. We would indeed like to digitize and then store the originals in [a] ‘dark archive’ so that they could be preserved.
5. *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*
 - a. We would be willing to circulate some of the items, if they are not too fragile to circulate.

Respondent 9

[Federal agency] has not yet reached the point of requiring off-site storage; plans for the next 10 years include reconfiguring existing underground space [at agency’s facility].

We are not, therefore, seeking to join an off-site storage consortium.

Respondent 10

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes, we are presently facing immediate collection space issues within [agency's facilities]. In addition, the materials in our storage facility include rare books and should be in a more environmentally controlled space. Water damage has always been a risk due to the storage facility being located on a lower level.

- 2) *If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*

Yes, as long as: 1) the price is right. 2) If we are able to retrieve books within a 24 business hour need either through physical access by our library staff or through a delivery system. We presently have approximately 150,000+ volumes and would look to store around 15–20 percent of the collection off-site.

- 3) *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*

No, they are not presently in digital format. Possibly, a select number would be digitized eventually, but there are no plans currently.

- 4) *Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?*

Yes, we have a collection of rare books. Our rare books should be retrievable and do circulate on a restricted basis already so a “dark archive” would be unnecessary. As long as the off-site facility was environmentally controlled and secure, our collection would not need to be segregated.

- 5) *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*

Circulation would need to be restricted to staff of [federal agency] only.

Respondent 11

- 1) *Is your library facing collection capacity issues that might require the acquisition of additional environmentally controlled storage space?*

Yes.

- 2) *If the answer to (1) is yes, would your library be interested in joining with the Library of Congress and other federal libraries to form a consortium, the purpose of which would be to pool resources in a shared off-site storage facility? How large is your collection, and what percentage (or number of volumes) would you be interested in storing in a shared facility?*

Yes. 130,000 items. Up to 50 percent of items would be of interest to store remotely.

- 3) *Are materials that you would designate for off-site storage available currently in digital format, or do you envision that they would be in the future?*

Half and half. Some materials are not currently available in digital format and may in the future. Other items would be those that we digitize and send the print copies for remote storage.

- 4) *Are any of these materials rare or difficult to replace? If yes, would your library be interested in storing materials in a “dark archive,” which would place significant restrictions on use and circulation?*

No. We would likely keep the rare materials on hand. If we did send them to storage, we would be interested in a “dark archive” option.

- 5) *Would you be willing to circulate materials to other members of the consortium, or would you prefer that circulation be restricted to members of your institution or limited in any other way?*

We would be willing to circulate materials to other members of the consortium (as we do already with interlibrary loan practices).

APPENDIX 3: ADDITIONAL PHOTOGRAPHS FROM OFF-SITE STORAGE FACILITIES

Upper Marlboro, Maryland



Washington Research Library Consortium (main entrance)

Source: Washington Research Library Consortium, <http://www.wrlc.org/>



Washington Research Library Consortium (gate to new module)

Source: Photo by Seth Elan

Fort Meade, Maryland



Library of Congress High Density Storage Facility (bar-coded storage boxes)

Source: Photo by Seth Elan



Library of Congress High Density Storage Facility (covered box)
Source: Photo by Seth Elan



Library of Congress High Density Storage Facility (special collections storage drawers)
Source: Photo by Seth Elan



Library of Congress High Density Storage Facility (Harvard-style shelving)
Source: Photo by Seth Elan

New Haven, Connecticut



Yale University Storage Facility (view from the north)
Source: Photo provided by Michael DiMassa, Director of YUSF



Yale University Storage Facility (close-up of storage module)
Source: Photo provided by Michael DiMassa, Director of YUSF

Princeton, New Jersey



Research Collections and Preservation Consortium (front entrance)

Source: ReCAP, <http://recap.princeton.edu/>



Research Collections and Preservation Consortium (electronic document delivery)

Source: ReCAP, <http://recap.princeton.edu/>

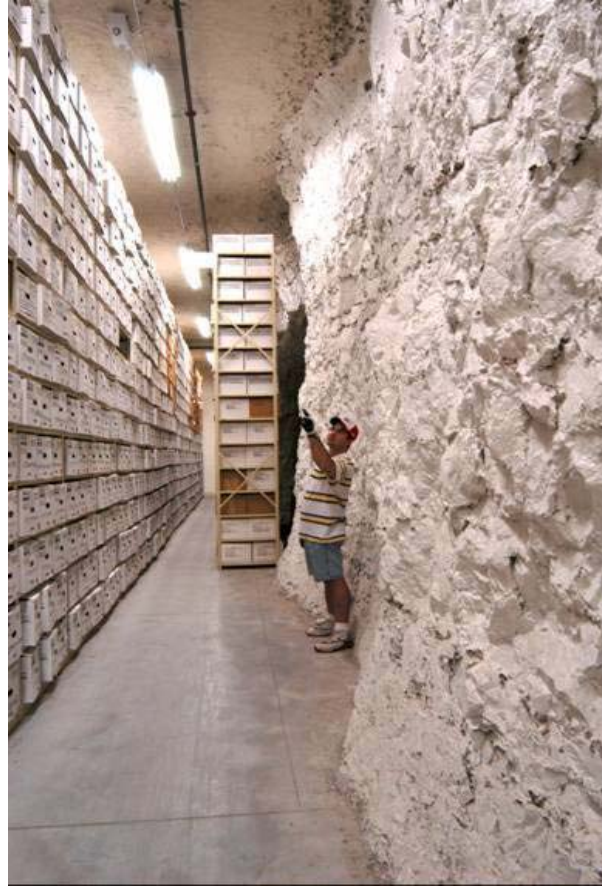
Lenexa, Kansas



NARA facility (entrance)
Source: NARA



NARA Facility (retrieving materials)
Source: NARA



NARA facility (storage bay in use)
Source: NARA

Valmeyer, Illinois



NARA facility (entrance to the cave complex)
Source: NARA



NARA facility (constructing storage bays)
Source: NARA



NARA facility (completed storage bay)
Source: NARA