

**THE EASTERN ACADEMIC SCHOLARS' TRUST (EAST):
A LARGE-SCALE SHARED PRINT COLLECTION
SERVING NORTHEASTERN ACADEMIC LIBRARIES**

A Proposal to the Andrew W. Mellon Foundation's
Scholarly Communications and Information Technology Program*

Boston Library Consortium
March 30, 2015

**Note: The text below is extracted from the full proposal that was submitted to the Andrew W. Mellon Foundation for consideration at the June 2015 meeting of its Board of Trustees. This document is being provided to EAST members to describe plans for implementing the EAST program if the grant is awarded. This proposal references 44 EAST members. Three libraries joined as Supporting Partners after the initial proposal submission, for a total of 47 current members. A full membership list is available at <https://www.blc.org/east-project>.*

SUMMARY

The Boston Library Consortium (BLC) requests a grant of \$994,771 from The Andrew W. Mellon Foundation (the Foundation) over two years to support implementation of the Eastern Academic Scholars' Trust (EAST), a regional collaboration among 44 academic libraries in the Northeast to define and manage retention agreements for infrequently used scholarly publications. In this context, retention is defined as a library agreeing to continue to hold particular titles in its collection for a specified period. The EAST retention program is designed to serve a core communication and collaboration function: institutions declaring commitments to portions of the scholarly record.

As described below, the project will include a probabilistic estimate of the likely existence of any item, based on carefully constructed sampling studies of individual collections, but it does not include item-by-item review of the physical object's condition or verification of the bibliographic accuracy of each of several million catalogue records. We see the EAST retention program as a rescue effort prior to that sort of triage. Retention is a logical prerequisite for preservation, and we expect this project to produce a much greater understanding of the collections needing to be preserved, but we are not at this stage proposing to accomplish the (much more expensive) item-specific inspection that would ultimately be required for thoughtful long-term preservation.

Plans for EAST were developed during an intensive 18-month process in 2012-2014, supported by a Mellon Foundation Officer's Grant to Five Colleges, Incorporated (FCI). Some 100 academic libraries in New England, New York and Pennsylvania participated in a needs assessment and planning discussions that recommended policies, governance, and a business model for EAST. The proposed two-year EAST organizational startup project will focus on defining a distributed and shared collection of monographs and establishing the

organizational infrastructure necessary to support the EAST program. During the project, EAST will pursue the following goals:

1. Analyze monograph holdings of EAST retention partners in the first cohort, identify overlaps, survey circulation activity within EAST, and develop comparisons to holdings elsewhere, in order to propose the commitments to be made by retention partners and establish the set of titles needing validation.
2. Design, test, and analyze a sample-based validation study to determine the statistical likelihood that a retained title actually exists on the shelves of retention partners. The confidence interval established by this two-stage study of each member library and of different levels of redundancy across the consortium will provide EAST's members with a shared metric of trustworthiness as they make retention commitments to one another.
3. Secure retention commitments from retention partners, and develop the means to share information about those commitments among all members.
4. Finalize and execute a Memorandum of Understanding (MOU) among EAST members that incorporates EAST policies and business model
5. Plan for future EAST membership, including incremental collection analysis of future cohorts, and ongoing validation sampling.
6. Begin to explore reciprocal agreements with other regional and national shared print programs to create a broader network of mutual benefits and services.

In the implementation phase and beyond, the Boston Library Consortium will manage the EAST program, hire and manage staff, serve as financial agent for member and vendor payments, and oversee and administer any grants that may be awarded.

PROJECT DESCRIPTION

Statement of Need

Even as electronic content becomes an increasingly large share of library collections, college and university libraries must accommodate the continued growth of print collections. According to biannual reports from the National Center for Education Statistics Academic Library Survey (NCES ALS), libraries at U.S. 4-year institutions continued to add (in the aggregate) between 19 million print volumes (reported 2006) and 25 million print volumes (reported in 2012) each year even as acquisition of electronic books more than tripled from about 14 million (2006) to 46 million (2012).

At the same time, libraries face increased demand to repurpose library spaces to meet new and emerging needs, creating technology-rich spaces that support digital scholarship and spaces for students to collaborate on group projects and/or work with faculty members. Given the breadth of digital access to library materials, many university administrators are reluctant to approve expansion of libraries to house print books. The result is that many

libraries face, at best, no additional capacity to house new books, and, at worst, reduced capacity for their growing print collections.

As print's passage to the future narrows, for all these reasons, we risk significant cultural losses if we fail to coordinate in managing the print record. Libraries have realized for more than a decade that coordinating print collections across multiple institutions will be a precondition for the long-term management of the cultural record¹. To begin with, carefully analyzed and systematically shared collections allow participating libraries to continue collecting print in areas of current faculty interest, while deselecting infrequently used library holdings when necessary. In shared print collections, long-term retention commitments made by some libraries allow others to withdraw infrequently used print volumes, while allowing their faculty to have confidence that they will still be able to borrow these titles when needed. Formally shared print collections provide a way for partner libraries to make informed decisions about whether to keep or withdraw individual holdings, and they reduce the risk that a consortium member might unwittingly discard the last copy of a book.

Journals

Most shared print agreements have focused initially on scholarly journals, and particularly on those that are also available electronically. There are almost a dozen North American shared journal agreements (as reported in CRL's Print Archives Preservation Registry (PAPR) database at papr.crl.edu), including the Western Regional Storage Trust (WEST), Association of Southeastern Libraries (ASERL) and Washington (DC) Research Library Consortium (WRLC) Scholars' Trust, and the CIC Shared Print Repository. The Five College Library Depository (FCLD) collection is one of the older and larger of such journal partnerships: it serves a consortium of more than 180 other college and university libraries and library consortia members (from New England, Pennsylvania, and the Midwest).

Monographs

In recent years, a number of library groups have planned or implemented shared print monograph collections. Retention agreements involving monographs are more complicated than journal-centered ones for several reasons:

- Monographs are less likely than journals to be available electronically. Ebook providers such as Wiley, JSTOR, and HathiTrust only cover a small fraction of the monograph titles held in academic libraries.
- The majority of books that are available in electronic form are likely to be under copyright, which limits their use as surrogates for print copies. Specifically, although journal readers usually need only a single article, which can be delivered electronically under fair use, users requesting monographs are likely to want the whole volume.

¹ See for example Bernard F. Reilly, Jr, "Developing Print Repositories: Models for Shared Preservation and Access," CLIR publication 117, June 2003. <http://www.clir.org/pubs/reports/reports/pub117/pub117.pdf>

- For those two reasons, a monograph agreement is more likely to require physical delivery of requested items.
- Monographs are unique, and they are not widely collected in series as journals are. As unique items in circulating collections, they are particularly vulnerable to loss, theft, misshelving, and other misfortunes, so shared monograph consortia need an empirical measure of confidence that titles retained actually exist.
- Space reclamation is less efficient because deselected volumes may be distributed widely throughout the shelves, requiring all volumes to be shifted in order to achieve contiguous reusable space.

The HathiTrust, which manages a digital collection derived from library monograph collections, is exploring a shared print retention program involving at least some of its members, and some of its members have participated in EAST planning discussions. It will obviously be important to coordinate EAST with this effort, as it develops. EAST libraries are already represented in the HathiTrust effort, as Matthew Sheehy of Brandeis University serves on the HTPMR planning committee.

Groups that are in some stage of planning for shared monograph collections include the Research Collections and Preservation Consortium (ReCAP), Academic Libraries of Indiana (ALI), six libraries of the California State University System, Statewide California Electronic Library Consortium (SCELC), Virtual Library of Virginia (VIVA), and the Washington (DC) Research Library Consortium (WRLC).

At least four shared monograph agreements have reached implementation to the point where retention commitments have been confirmed. The table below gives an overview of the scope of these agreements (information derived from their websites).

Group/Consortium	Total Libraries	Total Holdings Compared	Total Retentions	% Retained	Retention period
Central Iowa Collaborative Collections Initiative (CI-CCI)	5	1,048,251	152,657	15%	10 years
Connect New York	12	3,344,553	852,995	26%	15 years
Maine Shared Collection Strategy (MSCS)	8	2,920,014	1,466,935	50%	15 years
Michigan Shared Print Initiative (MI-SPI)	7	3,822,527	728,081	19%	15 years

These and other efforts to define shared journal and monograph collections demonstrate library interest in the coordinated management of distributed, circulating collections. Compared to these in terms of total holdings, EAST would be the largest such initiative, by nearly a factor of ten.

Development of EAST

According to a 2012 report by OCLC Research entitled “Print Management at ‘Mega-scale’: A Regional Perspective on Print Book Collections in North America”², the academic libraries in the Northeastern United States (the Boston to Washington, DC region) “account for nearly 60 percent of the entire North American print book collection.” This density of titles is a result of the density of higher education institutions in this region, which in turn is due at least in part to the density of population. Because of this density, there are multiple library consortia in the region, some of which (like Maine and ConnectNY) have initiated shared print programs, while others have not. At this point, though, most Northeastern libraries are not yet participating in a shared print agreement.

EAST grew out of a planning effort known originally as the Northeast Regional Library Print Management Planning Project, which was supported by the Andrew W. Mellon Foundation through an Officers’ Grant awarded to Five Colleges, Incorporated (FCI) in March 2012. Planning was directed by a Steering Committee comprised of 13 members representing 11 institutions and 4 consortia (see appendices for a list of Steering Committee members).

Assisted by shared print consultant Lizanne Payne, FCI convened conversations among more than 100 college and university librarians in the Northeastern United States to test interest in shared print management solutions and to create one or more plans and business models for shared management of retained print copies of infrequently used monographs and journals. All college and university libraries in New England and adjacent states were invited and have been kept informed of the progress of those conversations.

The project kick-off meeting in July 2013 attracted 106 attendees, from whom were formed three working groups (on Monographs, Journals and Serials, and Offsite Shelving) charged with developing retention arrangements and business models. The recommendations of the three working groups were combined in the *EAST Program Summary Document* (see appendices), endorsed by the 86 participants who attended the final meeting in July 2014.

Since that meeting, college and university library directors in New England and neighboring states were invited to make commitments to join EAST. This project's planning team and the EAST Steering Committee developed a proposed member fee schedule for varying levels of participation, and as a result 44 libraries have agreed to join the first cohort, including:

- 37 as monograph “Retention Partners.” Retention Partners are those libraries that are willing to make retention commitments to EAST covering parts of their print collections and are willing to participate in and provide financial support for the monograph collection analysis as well as ongoing support to the program.
- 6 as “Supporting Partners”. Supporting Partners are those libraries that are willing to participate in EAST by providing financial support to the program, in return for guaranteed access to EAST collections. They do not commit to retaining volumes for

² Lavoie, Brian, Constance Malpas and JD Shipengrover. 2012. Print Management at “Mega-scale”: A Regional Perspective on Print Book Collections in North America. Dublin, Ohio: OCLC Research. <http://www.oclc.org/research/publications/library/2012/2012-05.pdf>.

EAST and are not expected to participate in the monograph collection analysis. However, three Supporting Partners did agree to participate in the monograph collection analysis and to contribute financial support for it.

- 1 library (at the Woods Hole Oceanographic Institute) opted not to participate in monograph collection analysis but expressed interest in journals retention.

Of these prospective EAST members, 28 are from New England and 16 are from New York and Pennsylvania. The group comprises a wide range of universities and 4-year colleges (large and small, public and private, wealthy and not). Collectively, the libraries in EAST's first cohort hold more than 21 million titles in their monographic print collections.

These libraries have confirmed their participation in the initial development of EAST via a written Commitment Form and have agreed to join for specifically quoted annual fees. As EAST evolves and the formal MOU's are developed and agreed upon, the libraries will be asked to renew their commitment based on the emergent financial requirements of EAST. See the appendices for an example of the EAST Commitment Form and a full list of EAST members and the fees they have agreed to pay.

In discussions that took place during the fall and winter of 2014, the Boston Library Consortium (BLC) volunteered to assume leadership of the EAST project, because of its consonance with the BLC's historical mission of resource sharing, and the EAST Steering Committee accepted that offer. The arrangement includes hiring, housing, and managing EAST staff members and contractors, securing and administering grant funding, and overseeing project activities. BLC is a non-profit corporation serving 17 academic and research libraries from Massachusetts, Connecticut and New Hampshire, most of which have independently committed to EAST. The EAST project will be managed independently from other BLC consortial activities. While many of the BLC member libraries have also chosen to join the first cohort as EAST members, there is no requirement either for BLC libraries to join EAST or for EAST members to join the Boston Library Consortium. References to "members" and "membership fees" in this proposal are intended to be specific to the EAST membership as detailed in the appendices.

Note: While EAST members have expressed interest in continuing to explore journal retention agreements and other services, the remainder of this proposal describes the shared print monograph project for which grant funding is requested.

EAST Operating Principles, Business Model, and Governance

The EAST Program Summary Document (presented in the appendices) details the principles and policies of the EAST program. These principles and policies were recommended by the working groups, were approved by the Steering Committee, and were endorsed by the plenary EAST meeting in July 2014.

The policies spelled out in the EAST Program Summary Document formed the basis of the commitments that 44 libraries have made to support the organizational development of

EAST. Through governance, members will have an opportunity to review and modify EAST policies as they encounter the realities of implementation. One of the important steps in this process will be development of a formal Memorandum of Understanding (MOU) which will be executed by both retention and supporting partners and will define more specifically the responsibilities and benefits of membership in EAST as well as the fee structure. This MOU will replace the original Commitment Form and become the basis for ongoing membership in EAST.

Since the BLC is already a 501(c)(3) corporation, EAST does not need to incorporate separately or sort out a university hosting arrangement.

Membership

Membership in EAST is open to academic and research libraries in the Eastern United States who wish to participate in managing shared circulating collections, for regional retention and loan. Initially, there will be two partnership levels:

1. Retention Partners: These are libraries willing to commit (to their EAST partners) that they will retain, for a specific period of time, specific monograph titles in their print collections. Retention Partners must participate in monograph collection analysis, and they agree to contribute to underwriting some of the cost of that analysis.
2. Supporting Partners: These are libraries willing to participate in EAST by providing financial support to the EAST program, in return for the right to borrow from EAST collections. Supporting Partners may also choose to participate in monograph collection analysis.

Retention

Under the current recommendation, the retention partners will commit to hold specified materials for a minimum of 15 years. The retention agreement will be a separate document from the membership MOU, one that retention partners will execute to identify the holdings they have agreed to retain. Details of the retention agreement document will be developed during the implementation project, but those will at a minimum include the funding, review, validation, and renewal of retention commitments.

The EAST working groups spent considerable time discussing the optimal duration of a retention commitment. They recognized that deselection libraries would prefer the longest retention possible, but they also understood that the retention commitment constrains the retaining library in its use of space, which has an opportunity cost. Aspirations to institutional constancy were tempered by skepticism that a given administrator could bind his or her successor, much less that person's successor, to retain specific individual volumes.

The Steering Committee approved a minimum 15-year retention commitment for both monographs and journals as the best compromise to ensure availability and limit constraints. This commitment is consistent with other shared monograph agreements in other consortia (see the table on page 4, above). The Steering Committee also recommended that the EAST governing body revisit the initial retention commitments two years before they end, and at least every five years after that. EAST expects that when member commitments are up for renewal, the term of commitment might be recalibrated in light of yet to be established national or international consortial efforts.

Collection analysis

A fundamental activity of the proposed EAST implementation project is the print monograph collection analysis. This process will compare the circulating monograph holdings of EAST members to identify overlaps within EAST, show the occurrence of these holdings elsewhere (e.g., in WorldCat and HathiTrust), and display circulation activity to highlight candidates for retention or deselection. Circulation totals will be derived from transaction data provided by the libraries from their catalog systems, and will be used to identify the holding libraries where certain titles are most often called for (because these libraries would presumably be the most interested in making the commitment to retain those volumes). Similarly, lack of circulation at a given library may be a critical component of a library's decision to deselect that volume.

Through an RFI process in summer 2014, the EAST Steering Committee selected Sustainable Collections Services (SCS) to perform the EAST collection analysis because of the depth of the services they offered and their breadth of prior experience in shared print projects of a scope similar to EAST. OCLC acquired Sustainable Collection Services (SCS) on January 8, 2015, but for at least the next two years, SCS will continue to operate as it has, with Rick Lugg, Ruth Fischer, Andy Breeding, and Eric Redman continuing in their respective roles. See the appendices for a description of the RFI process and for more information about the OCLC acquisition of SCS.

SCS will analyze monograph holdings and circulation data for 40 EAST libraries: 34 will provide new data and SCS will re-use existing data for six EAST libraries that had undertaken SCS analysis in the last two years. (The appendix for EAST members indicates which of them will participate in the monograph collection analysis.) This collection analysis will provide data for EAST research on validation, and for modeling the needed number of copies for titles of different sorts, and the optimal distribution of retained copies among the retention partners, when balancing cost to the retaining (loaning) library against availability to (borrowing) partner libraries.

EAST's statistical consultant and SCS will lead an iterative process of analysis, discussion and review with the EAST retention partners and the Monographs Working Group. Outcomes from both the collection analysis and the statistical sampling of collections, as those emerge, will be input to discussions that will help EAST members define criteria for

retention (e.g. How many copies exist among EAST members? How many other copies exist elsewhere? Shall we consider only copies that have not circulated or that circulate very infrequently? Does the likelihood of existence remain the same at different levels of redundancy? What is the acceptable number of copies to be retained at partner libraries?)

Once criteria are agreed, SCS will produce reports for each of the retention partners proposing specific holdings to be retained, according to those criteria. Based on those reports, EAST will propose binding retention commitments, and each retention partner will either accept that proposal or negotiate a different one, and then execute the appropriate retention agreement. The SCS service will also provide an interactive database that all EAST members may use to review holdings using their own criteria to identify copies they may wish to withdraw.

See the appendices for a copy of the SCS proposal: it provides more information about the SCS decision-support process.

Validation

The consortial retention of large numbers of specific titles in distributed circulating collections relies on the availability of those titles for use by all partners. Verification of the existence and condition of retained holdings (known among shared print programs as “validation”) helps to build trust among partner libraries that retained volumes will, in fact, be available and usable. However, validation efforts span a spectrum of goals, with increasing level of effort and cost:

- Inventory confirmation: Is the volume actually on-shelf or otherwise accounted for (e.g., checked out)?
- Condition review: Is the volume’s physical condition good enough to support continued use (possibly by a larger number of patrons)? Are there conditions that should be recorded in the metadata, or is the result a simple binary (good enough, not good enough)? Should available copies be compared, in order to choose the one in best condition?
- Bibliographic review: Is the volume actually as described in the metadata (e.g. the correct edition)? Is there something interesting about the edition? Which is the best edition? For whose purpose?

Inventory confirmation is a necessary starting point, though bibliographic and condition reviews would be necessary for a full-scale preservation effort, at a significantly higher cost. This phase of EAST development is focused on retention, which logically and pragmatically precedes full-scale preservation. EAST members have a near-term goal to make sure they do not inadvertently discard the last copy of a monograph or reduce holdings to unacceptable levels given the possibility of missing copies. In fact, though, there is very little risk that any discards of items duplicated in the retention cohort will happen during the grant period, since it will take the full two-year grant period to determine what will be in that cohort. In

the longer run, capturing condition information when we sample and as items circulate is very likely the best we can do to understand whether we are likely to be retaining damaged or otherwise unusable copies. The bibliographic review, which would be aimed at privileging better or more interesting witnesses of particular titles raises many subjective scholarly issues (beginning with "Better or more interesting for what purpose?") that we don't think it can be addressed at all in the scope of this proposal. However, the work we are doing in the project we are proposing would be an excellent basis for a subsequent research proposal to develop affordable methods for condition review and bibliographic review.

During this proposed implementation project, we will establish a Validation Working Group to include EAST members, SCS representatives, and EAST's statistical consultant to design and execute a two-stage sample of member library and consortial collections, meant both to establish our level of confidence in individual collections and to determine the value of redundancy across collections.

In order to evaluate the statistical likelihood that a retained volume exists on the shelves of any of the institutions, we will design a two-part sample-based validation study. The specific goal of this testing will be to establish and document the degree of confidence, and the possibility of error, in any EAST member's commitment to retain a particular title. More literally, validation should reliably predict the likelihood that titles selected for retention actually exist and can be located in the collection of a Retention Partner. Financially, this research should also tell us the initial and ongoing costs of providing different levels of confidence in a shared print retention agreement based in circulating collections—not a simple problem.

Along the way, we will consider questions including: What is the probability that a given title exists in a library whose catalog includes it? Is that probability the same from one library to the next, or does it vary significantly by library? How much confidence would one require—how much uncertainty would be acceptable—if one were de-accessioning a volume on the basis of another library's consortial retention commitment? How often should you re-sample circulating collections, in order to estimate whether a library's advertised degree of confidence is going up or down? How much redundancy is affordable insurance against loss? What are the marginal costs of adding new members to the consortium, with respect to validation?

The overall goal of our validation research will be to find the best balance point between confidence and cost—a financially sustainable method of validation that provides sufficient confidence (probably when combined with redundancy) to allow for responsible deselection. See Major Project Activities (2) for more detail on this study.

Access and delivery

EAST materials will be considered a collection available for circulation (a light archive). Retention partners may impose certain limitations for unique or rare volumes, such as “in-library use only,” within reason. There is no intention to establish a dark archive (non-circulating collection) at this time.

EAST holdings will be discoverable in ways that are consistent with emerging national standards, using existing structures and systems for discovery, e.g., OCLC WorldCAT and CRL’s PAPER registry. Retention partners agree to fulfill requests for EAST materials through ILL at no charge to other EAST members. This like other recommendations will be reviewed during the implementation project to verify compatibility with other recommendations and ensure viability of the program.

Business Model

The business model for EAST is built around decentralized print retention (storing *in situ* by member libraries) and no-fee sharing agreements. Components of the EAST business model as recommended during the planning project and reported in the EAST Program Summary Document are as follows:

- Members will support the costs of ongoing operating expenses of the EAST program with annual Membership Fees scaled to the size of acquisition budgets. Scaled annual membership fees will be the same for both retention partners and supporting partners. These Membership Fees will cover staffing of the program, administrative management by the BLC, office operating costs such as rent and supplier and ongoing maintenance of the EAST website. Further details are provided below in the Budget Narrative and in the 5-year budget included in the appendices.
- Collection analysis (a periodic activity that recurs every few years) involves additional costs, beyond what is supported by membership fees. Those costs will vary based on the number and characteristics of the holdings of the participating libraries. A separate collection-analysis budget and cost-sharing agreement will be prepared for each period when collection analysis will be performed, with resulting fees to be paid by retention partners and any supporting partners who wish to be included in the collection analysis. Retention partners are required to participate in and share the costs of collection analysis, because retention commitments must be based on that analysis.
- Retention partners will not receive direct compensation for holding and lending materials, but most EAST members have signed up to be retention partners, and as such they will have comparable obligations and benefits. In the first cohort, 37 of the 44 members are monograph retention partners. Omitting direct compensation to retention partners helps contain costs for all members (because that compensation would need to be covered by member fees).

- Members will absorb all other costs of participation including the costs of space usage, lending and metadata creation.

In developing its business model, EAST will review business models in place for other monographic print retention agreements (especially the four operational programs listed in the earlier table). Publicly available MOUs, reports, and presentations do not go into much detail on these business models, but most appear to include a membership fee and some appear to include chargebacks for borrowing.

EAST will also leverage, wherever possible, the research being sponsored by the Council on Library Resources (CLIR)'s Committee for Coherence at Scale in Higher Education, particularly its research on developing "business models for operating analog repositories more coherently and efficiently at a larger scale." Examples of possible collaboration include design of sampling method for validation, developing formulae to determine how many copies should be kept of each item, and sharing ideas and research on business models for sustainability. See the appendices for a letter of support from CLIR President Chuck Henry.

Governance

Under the current recommendation incorporated in the EAST Program Summary Document, EAST will be governed by an elected Executive Committee of up to twelve representatives of the participating libraries, predominantly representing the monograph retention partners, but with some representation of supporting partners and consortia (see the appendices). Functioning essentially as a Board of Directors, the Executive Committee will approve EAST operating policies and the business model and operating budget. Specific roles and responsibilities of the Executive Committee will be detailed in the EAST MOU. Election of the first EAST Executive Committee is expected to take place in March – April 2015 based on the then-committed membership. Prior to election, the planning grant's Steering Committee will continue to serve as EAST's primary governing body.

Major Project Activities

EAST has established five objectives for the two-year implementation project:

1. Define initial shared monograph collection, including undertaking the large scale collection analysis
 2. Design and test a two-part sample-based validation study focusing on inventory confirmation
 3. Finalize and execute a Memorandum of Understanding (MOU)
 4. Plan for future EAST membership
 5. Explore reciprocal agreements with other shared print programs
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1. Define shared monograph collection

This is the primary activity of the EAST implementation project. A Monographs Working Group will be established that will help shape the collection analysis scenarios (along with libraries participating in the collection analysis) and finalize policy recommendations related to the initial EAST shared monograph collection. Because a group representing each of the 44 members would be too large to function effectively, the Executive Committee will appoint 10 to 15 members to the Monographs Working Group to represent both retention partners and supporting partners. A similar group was convened during the EAST planning project (see appendices). The Monographs Working Group will oversee three related activities:

a. Analyze monograph holdings

Beginning in July 2015, libraries, project staff, and SCS will ingest and analyze monograph holdings of the 40 libraries that agreed to participate in EAST monograph collections analysis. To focus efforts and contain costs, collection analysis will be limited to circulating monograph collections (no reference, audiovisual, or government documents). Libraries that wish to update their OCLC records through a reclamation project will be encouraged to complete that effort before EAST collection analysis begins.

There will be several categories of library files to analyze:

- New analyses: Approximately 34 libraries will provide new holdings files for ingest and analysis
- Recent analyses: Six libraries provided holdings data to SCS since July 2013 that will be included in the EAST analysis (Amherst College, Boston College, University of Rochester, St. Anselm's College, Tufts University, Yeshiva University)
- Existing retention commitments: Eight libraries in the Maine Shared Collections Strategy and 12 libraries in ConnectNY have made retention commitments based on earlier SCS analysis but do not wish to participate in a new EAST analysis. With their permission, we will use the retention reports prepared during their earlier analysis to identify existing commitments in the region to inform EAST retention decisions. These retention reports list the specific holdings that were identified for retention by each of those 20 libraries; this data will be incorporated into the automated SCS analysis for EAST. Knowing of these commitments, EAST libraries might choose, for example, to retain fewer copies of corresponding holdings, or only retain copies in EAST geographic areas farther from Maine and New York. These are the sorts of decisions that will be discussed during scenario-building with SCS.

b. Define retention criteria and review scenarios

EAST libraries will review and discuss collection analysis data provided by SCS in order to identify holdings that will be retained for the shared collection. Representatives of the collection analysis libraries (working with guidance from the Monographs Working Group) will identify retention scenarios to be considered such as the number of copies to be retained across the group, availability elsewhere as shown in WorldCat and HathiTrust, usage

criteria, publication date, geographic distribution, and load balancing among retention partners. An example of a retention scenario is “retain all holdings that are unique to the group and at least 3 holdings of widely held titles in the group for materials published before 2005.” This activity will also include identifying additional EAST copies of holdings already retained by MSCS and/or ConnectNY libraries as described above. Definition of the desired number of copies to retain (redundancy) will be informed by the research and modeling that will be underway during the same time period for design of the validation sampling study.

An iterative “scenario-building” process will take place over several months, with SCS assisting the EAST libraries to compare the results of various scenarios and the validation sampling studies to determine the preferred approach to identifying holdings for retention. See the appendices for a description of this process in the SCS proposal.

c. Identify retention partners and their committed holdings

As a final step once the desired retention scenario has been agreed, EAST retention partners will have the opportunity to review the proposed list of retention commitments and may choose to retain any or all of the proposed holdings, subject to the EAST MOU. It is after this final step that the final set of retention commitments will be known. Retention partners will submit metadata to local catalogs and to regional and/or national registries describing their commitments, as required by EAST policies.

2. Develop and test a two-part sample-based validation study focusing on inventory confirmation

Existing shared print monograph projects have agreed to retain 15% to 50% of their combined collections for retention: this percentage does not appear to correlate (in a sample of four) with size of collection, number of partners, or any other dimension. The largest of these existing shared print monograph projects have total combined collections of about 3 million volumes, and they do not do consortial validation. EAST will have combined monograph collections of roughly 20 million volumes in the first cohort: if the EAST partners decided to retain a low-end 20% of that, the retention collection would be 4 million volumes. The actual size of the retention collection agreed upon will have to emerge from discussions that have yet to take place, and that will be based on collection analysis and on the validation study's results.

A recent experiment at Whittier College, in a validation for existence and basic condition, suggests that in some cases validation efforts can confirm the existence of about 30 volumes per worker per hour. However, the Whittier example does not account for the time spent extracting and randomizing the catalog records to be used in sampling, organizing the sampling process itself, training samplers. It also does not account for costs that might be incident on sampling multiple different libraries with different layouts, different shelving practices, etc. However, most of the cost of this exercise will be in the actual sampling

itself, so assuming student workers at \$10/hour are capable of validating 30 volumes per hour, this kind of validation effort would cost 33 cents per volume. Using this item cost, it would cost about \$1.3M to validate the existence and basic “good-enough” condition of each of four million volumes. Such a cost is approximately four times the projected annual operating budget of EAST.

Clearly, an approach to validation based on sampling is required—but how large a sample is sufficient to indicate the reliability of a particular collection? Will confidence levels vary by library collection? Will confidence levels vary across tiers of redundancy? How should these different confidence levels be weighted or combined to produce a measure that indicates consortial confidence? These are research questions, the answers to which will not be known until EAST validation methods are actually designed and tested. Moreover, since these are circulating collections, materials identified for retention could be lost, stolen, damaged, or misshelved at any time, the question arises as to what is the appropriate interval for re-sampling a given collection, and what percentage of the retained collection should be sampled in validations subsequent to the first. After the consortium's initial validation exercise, when new cohorts of retention partners add in, does the validation of their committed titles become any less expensive because of previous validation efforts? These are also research questions.

The first step in EAST's validation study will be to draw a random sample of volumes from the total population of each Retention Partner's collection. When calculating the sample size for each of the 40 academic libraries, we will aim, at first, for a conservative margin of error of 1% and a confidence interval of 99%. The actual sample sizes at this stage of the process will vary from institution to institution as the total number of items in each collection will be different. However, for the purposes of estimating budget, let's assume that if we have total collections of 20 million titles across 40 libraries, each collection averages 500,000 items. To sample a population of 500,000 to a 99% confidence level, with a 1% margin of error, would require a sample size of 16,105 per collection. At 33 cents per item sampled, the cost of sampling would be \$5314.65 per library, or \$212,586 across all 40 libraries.

This analysis can be done on a rolling basis, library by library, since the datasets that would support library-specific random sampling will already exist in some cases (for libraries that have recently completed their own collection analyses), and will become available from others during the first six months of the project proposed here. By sampling across entire but discrete collections, we will ensure that each item in a given collection has an equal chance of being included in the sample.

This first step of sampling individual member collections will provide us with a common metric of reliability across member collections, one that allows EAST to estimate the likelihood that titles in a given partner's retention collection are in fact on that partner's shelves. We could also capture some sense of the general condition of items in each collection, through this process.

In the course of designing this study and analyzing its results, the partners of EAST will have to determine what margin of error is acceptable in planning and affordable in sampling. For example, sampling to an error rate of plus or minus 1% in any given library's collection is probably the best we can afford to do, and it seems acceptable, given that we plan to retain multiple copies of retained titles, in multiple collections. It should also be noted that sampling is predictive, and sampling to a certainty of plus or minus 1% does not mean that we *will* find 1% of the books missing—it just means that we can predict we will *not* find *more* than 1% missing. As the consortium monitors missing materials over time, we may well find that actual holdings errors occur at a fraction of 1%, though sampling at that fractional level to predict the actual numbers would have been unaffordable.

As EAST progresses through the process of coordinating collection datasets across libraries, it will become clear what titles exist in multiple copies across the consortium, and that will make possible the second phase of sampling, which will focus on establishing error rates at different levels of redundancy. This will help EAST to determine what level of redundancy would produce acceptable confidence in consortial retention commitments. That, in turn, will help to define the actual retention commitments.

This second stage of the validation study will draw a stratified sample at the consortium level, where each stratum represents a different level of redundancy. In particular, we will test to see whether redundancy has an effect on the condition or existence of titles such that the rarer a title is, the more likely a copy will be defaced or missing, and we will design our sampling to determine what level of redundancy offsets the risk of low inventory while avoiding levels of duplication that are statistically unlikely to make a difference in ensuring the existence of the last copy. This should help us to establish the level of redundancy EAST members would regard as close enough to total reliability.

For the purpose of budgeting, though, here is a likely scenario: If 40 libraries agree to share 4 million volumes, and we want to sample several strata of those volumes (say, for 2-, 3-, and 4-copy items), we could estimate each tier might contain a million items because

- according to Lavoie, Malpas and Shipengrover (see note 2, above, on page 4), the average number of holdings per publication in the Bos-Wash "mega-region" is 7.3 copies (191.6M holdings of 26.1M publications), and
- in our shared collection of about 4M, we are not likely to focus on titles where we have a lot of known copies (say, 6 or more), nor on items where we already know we only have one copy, but we are very likely to include items of which we have 2, 3, or 4 copies

For the purpose of estimation, then, we will assume populations of 1M or fewer at each of those tiers, and budget on that basis. Sampling three populations of a million items to 99% confidence with .5% margin of error would require three samples of 62,410. At 33 cents per item, each of those samples would cost \$20,595, for a total of \$61,785. At 1% margin of error, those sample sizes would be 16,369, and the dollar amounts would be \$5401 per sample, or \$16,205 for all three. Because redundancy is proposed as the failsafe for missing

copies, and because in this second round we will be sampling fewer populations (three instead of forty), our budget proposes the \$61,785 for a .5% margin of error.

EAST will establish a Validation Working Group to oversee the design, execution, and analysis of this research. The Validation Working Group will be a representative body of 8 to 10 members from EAST Retention Partners with expertise in collection management, appointed by the EAST Executive Committee, and will also include SCS representatives and EAST's statistical consultant.

The validation studies will use statistically sound and contextually appropriate sampling methods, and will combine the results of those methods with precautionary redundancy in the retained collections at a level that will be defined both mathematically and procedurally. For example, from a procedural point of view, we might follow a retention algorithm something like this:

- If all copies are missing, we regret that, but can do nothing.
- If there is one, we save it very carefully.
- If there are two, we almost certainly save both.
- If there are three, we very likely save all of those, depending on the outcome of statistical modeling.
- If there are four or more, we retain the number of duplicates suggested by the second-round sampling study.

Confidence in the existence of retained volumes can never be complete (unless the volumes are individually validated and then taken out of circulation), but we will aim for the highest affordable degree of confidence.

Mike Garabedian points out, in the Whittier College presentation included among the appendices of this proposal, that the decision to discard copies of books retained elsewhere should ideally be informed not only by confidence in the retention commitment, but also by sampling for preservation purposes. As we have discussed, sampling for preservation would involve not only validating the condition of a volume, but also evaluating the relative importance of different editions of the same title. This work is out of scope for the current proposal, but we expect that our research on retention will inform future work, by us or by others, on shared preservation. Meanwhile, we will make an effort at touch-points during sampling and circulation of items to record basic condition information.

3. Finalize and execute a Memorandum of Understanding (MOU)

An explicit Memorandum of Understanding and other related EAST documents (e.g., retention agreements) will be developed during the implementation period. While substantial work has been done during the EAST planning project to define policies and services for the program as described earlier, it will be necessary to review and confirm or modify those policies, and then to incorporate the final policies into a formal agreement that is acceptable to varying kinds of institutions. Part of the planning that remains will be to develop an MOU

document that is lightweight enough to facilitate execution by many kinds of libraries, but substantial enough to support long-term commitments and allow for future changes. A related decision will need to be made about how to record explicit retention agreements and how the retention agreements relate to the MOU document.

4. Plan for future EAST membership

A large number of Eastern libraries participated in the initial EAST planning (about 100) and about 60 indicated strong interest in joining as of summer 2014. During and after the work to analyze collections and define retention commitments for the initial cohort, EAST will plan for the addition of future retention partners. Supporting partners who do not wish to participate in collection analysis may join at any time. As part of building the initial collection analysis database and reports, EAST and contractor SCS will design a method to incorporate future data and build on previous holdings data and retention commitments to minimize cost and effort for the future participating libraries.

One of the most important activities of this planning effort will be to review the initial business model and revise as needed to support sustainability of the program (including ongoing administration and any future collection analysis or validation). The initial business model is built around the assumption that future member cohorts will need to be analyzed and incorporated into the shared print agreement in roughly 2-year increments. If EAST members (through the governing Executive Committee) wish to undertake additional services or to accommodate new members on different timetables, or if membership stabilizes at a certain level in the future, it will be necessary to identify which costs are ongoing, which may decline, which may rise, and how to fund them through a future business model. At the same time, it will be important to review the fee structure for members to insure equitable cost recovery and perhaps to revisit assumptions made in budgeting this proposal.

EAST also expects to explore possible partnerships with the largest research libraries in the region such as Harvard, Yale, Brown, Dartmouth, and MIT. Although these institutions participated actively in the initial planning discussions for EAST, they are also engaged in discussions about the national HathiTrust shared print program, with partners in existing groups such as IvyPlus and BorrowDirect, and smaller bilateral or multilateral agreements. Representatives of some of these large libraries observed that their early involvement in EAST might cause other EAST libraries to hold back on making retention commitments, relying instead on the larger libraries for retention. By continuing to work with these larger libraries as EAST becomes operational, we hope to determine whether EAST might partner with them in broader, possibly national retention programs, whether they might be interested in a deep retention role where they would be the providers of last resort, and whether other mutually beneficial forms of collaboration might exist.

5. Explore reciprocal agreements with other shared print programs

Prospective EAST membership overlaps with other shared print agreements that are in various stages of implementation. We will work closely with those institutions that already have shared long-term retention agreements for print materials to align and incorporate the existing agreements among the groups whose members are represented in EAST (Maine Shared Collections Strategy, ConnectNY, Five Colleges, PALCI).

In addition, we will explore coordination with other existing or emerging shared print programs whose membership and goals align with those of EAST, e.g., HathiTrust.

These planning efforts will identify issues and options for potential agreements between EAST and other shared print programs (that is, program-to-program agreements rather than individual new members of EAST). Examples of issues to be explored include:

- Under what circumstances would one shared-print group agree to extend access to its collections to other shared-print groups?
- Should such extensions change the number of copies to be retained, and if so, how would that change be implemented?
- What is the effect of such extensions on discovery and delivery across partnerships?

A report will be produced that describes the issues and lays out a plan for one or more program-to-program agreements to affiliate EAST with other regional efforts.

STAFFING

Principal Investigators

The Principal Investigators will be:

- John Unsworth, Vice Provost, University Librarian, and Chief Information Officer at Brandeis University and President, Board of Directors, Boston Library Consortium
- Laura Wood, Director, Tisch Library, Tufts University and Vice President/President-Elect, Board of Directors, Boston Library Consortium

The Principal Investigators are responsible for insuring that the goals and obligations of the project are achieved with respect to requirements of the grant.

Key Personnel

Susan Stearns (Executive Director, BLC) will serve as the Project Director. In that role she will be responsible for oversight of all project activities and will have specific responsibility for establishing staff and administrative functions to support the program, and serving as primary liaison to and convener of the EAST Executive Committee.

The Project Manager (to be hired) will be responsible for managing activities necessary to implement the EAST program as described in the Timeline section. Specific responsibilities will include: coordinate EAST library participation in the monograph collection analysis; work with EAST working groups to define additional policies as need (e.g. metadata

standards); participate in development of the EAST MOU; coordinate outreach to other potential EAST members; and explore collaboration with related shared print programs.

The Data Librarian (to be hired) is a half-time position primarily during Year 1, with responsibility to assist EAST libraries with preparation of data for export to SCS for collection analysis, and to produce additional analysis reports for EAST libraries and working groups as needed based on reports provided by SCS. During Years 1 and 2, the Data Librarian will also be involved in the validation study.

See the appendices for job descriptions for the Project Manager and Data Librarian, and CVs for Susan Stearns, John Unsworth, and Laura Wood.

Lizanne Payne will serve as Shared Print Consultant. Her primary responsibilities are to provide guidance and prepare background documents to the project team, Executive Committee, and member libraries to develop the MOU and retention agreement documents; to refine policies; to support design of the validation sampling study; to plan for additional EAST members (including business model review) and to explore collaboration with other shared print programs. She will serve as Project Manager in the initial few months before the Project Manager is hired, primarily to coordinate the initial collection analysis work with EAST libraries and SCS. See appendices for Lizanne Payne's consulting proposal including CV.

The Statistical Consultant will design and analyze the two-part validation study. EAST will draw on an available academic marketplace, with a preference for expertise in quantitative methods combined with experience in circulating collections. We would look first to places like the ARL and the ALA, or research centers in iSchools, or advertised statistical consulting services from academic departments at Stanford, Illinois, Indiana, Cornell, and elsewhere.

TIMELINE

Pre-grant activities, Spring 2015

Certain activities are continuing in advance of the proposed grant period, building on the primary planning effort that took place in 2013-2014. These activities include:

- Elect the Executive Committee (governing body) from among those libraries making a firm commitment to participate (March – April 2015: Current Steering Committee, Susan Stearns)
- Begin work on EAST program MOU and associated retention agreements based on EAST policies (April – June 2015: Executive Committee, Lizanne Payne)
- Establish Monographs Working Group that will recommend collection analysis criteria and finalize policies (April – June 2015: Executive Committee, Lizanne Payne)

Ms. Payne's participation during the pre-grant period is being funded by member fees provided by a small number of institutions.

Year 1: July 2015 – June 2016

1. Administration
 - Hire project staff (Project Manager, Data Librarian) and establish office (June – August 2015: Susan Stearns and a search committee to be identified)
 - Execute contract with collection analysis vendor (SCS) and project consultant (Lizanne Payne) (June 2015: Susan Stearns with review by Executive Committee)
 - Collect participant fees and cost analysis fees from retention and supporting partners based on signed Commitment Forms (July 2015: Susan Stearns, BLC Operations Manager)
2. Governance
 - Review and confirm or revise policies related to retention period, validation, disclosure and metadata guidelines, access and delivery (ongoing, iterative with collection analysis and validation work) (September 2015 – December 2016: Project Manager, Lizanne Payne, Working Groups, Executive Committee)
3. Validation study #1
 - Engage Statistical Consultant and establish Validation Working Group (July – September 2015: Susan Stearns and Executive Committee)
 - Design a statistically valid sampling study to confirm the presence of titles in circulating monograph collections (full collections) at prospective Retention Partner libraries. Includes development of data collection methods (manual and/or automated) and training materials (October - December 2015: Project Manager, Statistical Consultant, Data Librarian)
 - Conduct validation study #1; includes extraction of sample sets from holdings data provided for SCS analysis, training student workers, pulling/validating volumes, and reporting results. (January – April 2016: Project Manager, Data Librarian, Statistical Consultant).
4. Monograph collection analysis
 - Gather local holdings and circulation data from approximately 34 new-analysis participants (July – December 2015: Project Manager, Data Librarian, Lizanne Payne, SCS)
 - Incorporate previously-analyzed data from six libraries and retention commitments from Maine and ConnectNY libraries (July – December 2015: SCS)
 - Conduct iterative scenario modeling; determine and apply analysis criteria to compare holdings; incorporate results of validation study #1; (January – June 2016: SCS, Project Manager, Lizanne Payne, Monographs Working Group, Data Librarian)
 - Prepare retention proposals based on approved scenario (June 2016: SCS, Project Manager, Lizanne Payne, Monographs Working Group, Data Librarian).

Year 2: July 2016 – June 2017

1. Validation study #2
 - Design and develop a statistically valid sampling study to confirm the presence of titles proposed for retention at Retention Partner libraries (retention collections) based on total number of proposed retentions and suggested redundancy levels. Includes review/revision of data collection methods and training materials developed for validation study #1 (July - August 2016: Project Manager, Statistical Consultant, Data Librarian)
 - Conduct validation study #2; includes extraction of sample sets from retention proposals provided by SCS, training student workers, pulling/validating volumes, and reporting results. (September - November 2016: Project Manager, Data Librarian, Statistical Consultant).
2. Retention agreements
 - Finalize monograph retention decisions and retention partners as needed based on validation study #2 (December 2016 - March 2017: Project Manager, Statistical Consultant, Lizanne Payne, Retention Partners)
 - Document retention commitments as required by disclosure policy: (beginning April 2017: Retention Partners)
3. Governance
 - Finalize EAST program MOU documents (based on review of recommended EAST policies) and EAST retention agreement document (to the extent separate from MOU, to be determined) (April – May 2017: Lizanne Payne, Susan Stearns, Executive Committee, Project Manager)
 - Execute EAST program MOU and final retention agreements with members (May - June 2017: Susan Stearns, BLC Operations Manager)
4. Future EAST membership
 - Define methods to facilitate future EAST collection analysis using SCS for additional libraries (July – December 2016: SCS, Project Manager, Lizanne Payne)
 - Develop sustainable business model for next phase of EAST (October 2016 – March 2017: Lizanne Payne, Susan Stearns, Project Manager, Executive Committee)
 - Develop plan and schedule for addition of new EAST partners, including identify interested libraries (April - June 2017: Project Manager, Executive Committee)
5. Collaboration with other regional shared print programs
 - Invite related shared print programs as potential collaboration partners (e.g., current programs Maine Shared Collections Strategy, ConnectNY, and PALCI, and evolving agreements such as Brown/Dartmouth, IvyPlus, HathiTrust) (September – October 2016: Susan Stearns, Project Manager, Lizanne Payne, Executive Committee)

- Convene a web-based meeting to identify issues and options for formal reciprocal agreement(s) between EAST and other programs (February 2017: Project Manager, Lizanne Payne, Executive Committee)
- Prepare a report that describes the issues and lays out a plan for one or more agreements to affiliate EAST with other regional and national efforts (March – April 2017: Lizanne Payne, Project Manager)

OUTCOMES AND BENEFITS

As a result of implementing the Eastern Academic Scholars' Trust (EAST), we expect to achieve the following results:

1. Identify and commit to retain a large number of monographs distributed among dozens of retention partners. The specific number of retained monograph holdings will not be known until completion of the collection analysis and scenario modeling activities, but assuming a retention percentage consistent with similar projects, EAST may identify about 20% of circulating monograph holdings to be retained, which would total as many as 4 million volumes across the current 37 EAST retention partners.
2. Design, test, price, and document validation sampling procedures and policies that provide adequate and well understood levels of confidence in the ability of retention partners to produce retained titles when they are needed. The new knowledge acquired through sample-based validation of large collections of monographs would benefit not only the partners in EAST, but also other shared retention programs, and even individual libraries seeking to determine the probable state of their own collections.
3. Establish an organizational structure and governance to support retention of and access to the EAST regional shared print collection among committed members, allowing all members to retain holdings and/or reclaim library shelf space to meet their own collection-management needs.
4. Establish plans and methods to increase EAST membership and connect EAST collections to other shared print collections in the region and around the U.S.

INTELLECTUAL PROPERTY

EAST will develop no software or other content subject to intellectual property rights during this project.

SUSTAINABILITY

A shared print program like EAST involves two kinds of sustainability:

1. Sustainability of the results—the retention commitments, in this case; and
2. Sustainability of the program: the ability to operate the program (staffing) and perform its activities (e.g., collection analysis).

Sustainability of the results

In addition to the specific retention agreements to be executed by retention partners, the overall MOU will include provisions for handling future changes to retention commitments. Under the initial business model, the costs to maintain holdings under the retention commitments are borne by the Retention Partners. EAST working groups recommended that the Steering Committee revisit retention commitments every five years to determine if circumstances warrant extending or reducing the commitment periods for certain kinds of materials. Examples of such circumstances might be changes in technology or in the (legal) availability of digital surrogates, or increased (or decreased) numbers of print copies preserved around the country or the world. The MOU will also include provisions to handle cases where retention partners need to divest some of their retained holdings, e.g., requiring them to transfer these holdings to another EAST library. Finally, we will know more about the long-term cost and the real value of retention commitments when we determine the scope and frequency of validation that produces an agreed-upon level of confidence in the collections of others.

Sustainability of the program

The initial business model is designed to support active implementation of new members through periodic collection analysis in roughly 2-year increments. By the end of Year 2, implementation of the first cohort will be complete and EAST will have determined how many additional libraries are interested in joining the next cohort as retention partners (with collection analysis). At that point a revised business model will be proposed to support the next round of implementation.

Over the next few years, we expect that EAST will attract new retention partners and supporting partners seeking to obtain the flexibility to manage their print collections with selective withdrawals backed by the right to borrow from the retained items held in the shared EAST collection. Outreach to potential EAST members and to other shared print programs is an explicit activity of the proposed implementation project especially in Year 2.

EAST planners have developed a projected five-year budget for the program (see appendices) based on certain assumptions that we believe to be realistic. The projected budget assumes 20 new members will join EAST in Year 3, of which 15 would participate in the collection analysis. We believe that 20 new members (above the first cohort of 44) is a feasible number given that 60 libraries initially expressed their intention to join and more

than 100 were interested enough to send staff to the two all-day planning meetings in 2013-2014.

REPORTING

BLC will provide the Foundation with annual reports according to the schedule specified in the Foundation's award letter: 3 months after the first anniversary of the grant start date (September 30, 2016) and 3 months after the grant end date (September 30, 2017).